

UNIVERSITY
OF MICHIGAN

MAY 26 1954

DENTISTRY
LIBRARY

Dental Digest

May 1954

IN THIS ISSUE

- Appraisal of Balance200
- of Magnetic Forces
in Prosthetic Dentistry205
- ature and the Dentition207
- ll Denture Construction
With Stress on Elimination
of Laboratory Processing
Errors208
- e Temporomandibular Joint
n Vitamin C Deficiency214
- ly Chemistry in Health and
Disease215
- estinal Toxemia and
Periodontitis223
- e Meaning of Disease224
- mal Sinuses of Dental
Origin234

(A complete Table of Contents
appears on page 199)

(Cover illustration—Page article,
page 200)



"Living esthetics... in

outstanding
tooth materials!



VERI-CHROME PORCELAIN and VERIDENT PLASTIC

- This helpful literature is available upon request:
1. Illustrated Mold Chart
 2. 60 Personalized Five-Phase Anterior Denture Arrangements
 3. 32-page Book: Varied Labial Surfaces and Their Relation To Scientific Tooth Selection



You get personalized esthetics with Five-Phase Anteriors so easily, because they provide varied labial surfaces... co-acting proximals... because they are arranged in an understandable mold system that simplifies proper selection and transposition of teeth... because Five-Phase Anteriors are made in Veri-chrome Natural Tooth Colors, with brilliance controlled to permit the satisfactory use of different tooth colors in the denture, when required.

Now, you can select Five-Phase Anteriors in a choice of Veri-chrome Porcelain or Verident Plastic—each, a time-tested, fully proved, superior tooth material.

The patient-confidence inspired by the distinctive "living" esthetics you create with Five-Phase Anteriors in Veri-chrome Porcelain or Verident Plastic is vitally important. Full details are available in our literature. Write for your copies.

SPECIFY FIVE-PHASE ANTERIORS IN
VERI-CHROME PORCELAIN OR
VERIDENT PLASTIC, WITH THE
VERI-CHROME COLOR GUIDE.

VERI-CHROME COLOR GUIDE

FIVE-PHASE ANTERIORS

Convenience and Comfort

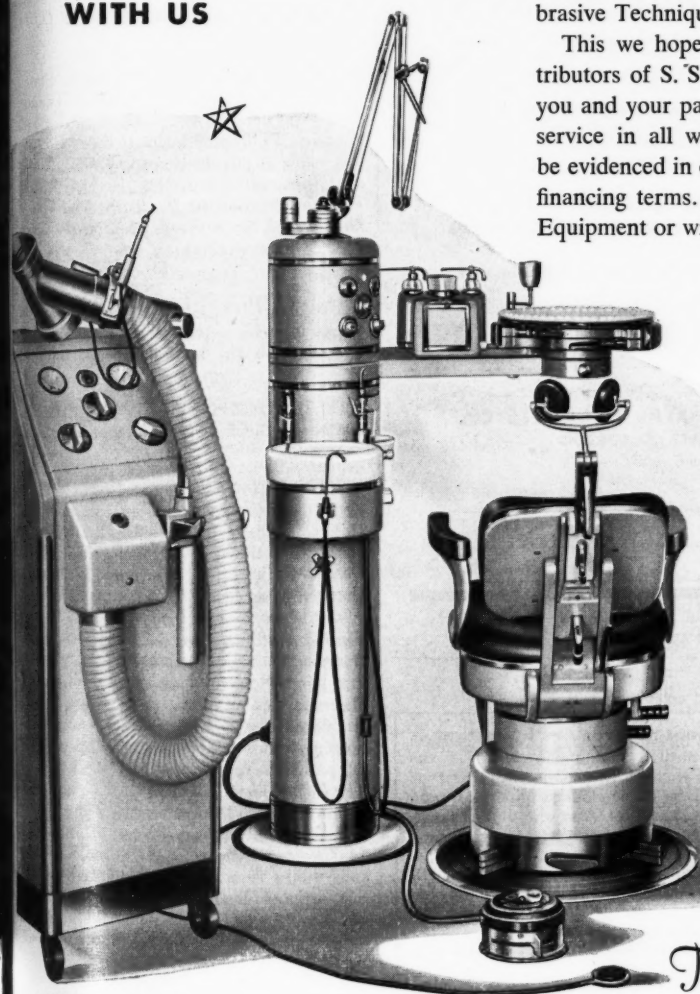
**FOR YOU
AND YOUR PATIENT
HAVE ALWAYS
BEEN IMPORTANT
WITH US**

This is why, after 110 years, we are still pioneering, still searching, still devising, still improving, to promote better aids for dentistry. Perhaps you are aware of this.

There is a dramatic story, for example, much too long, for this page, in the evolution of S. S. White Equipment for convenience and comfort in the dental operating room. It stems from "headrest that can be adapted to any kind of chair, well suited to the traveling dentist," made by Dr. Samuel S. White in 1844, through the first self-cleansing cuspidor made in '66, the first electric engine in '70, first all-metal chair in '71, first chair to introduce the compensating seat and backrest in '72, the first hydraulic chair in '77, the first chair to give horizontal position in '99, the first equipment unit in 1913. The list of "firsts" is long, impressive, touches almost every phase of dentistry.

In 1938 the S. S. White Master Unit brought modern styling into the operating room. In 1950, a new triumph in dentistry's conquest over pain came with the introduction of the S. S. White "Airdent" Unit for cavity preparation by the "Air-brasive Technique".

This we hope you will remember always—we and all distributors of S. S. White products have a constant concern for you and your patients and strive always to provide superlative service in all we do and make for you. Proof of this will be evidenced in our free office planning service and convenient financing terms. Test us. Ask any distributor of S. S. White Equipment or write direct.



The S. S. White

211 S. TWELFTH STREET, PHILADELPHIA 5, PA.

**DENTAL
MANUFACTURING CO.**



DON'T OVERLOOK THIS OPPORTUNITY TO BUILD RESPECT WITH PARENTS AND CHILD PATIENTS

Fractured teeth are common and serious occurrences. Rough games, drinking fountain accidents, and minor auto collisions are just a few of the causes. When such an emergency happens the dentist must treat the tooth rapidly and effectively to save the tooth.

Rocky Mountain's new permanent Anterior Crowns provide a more positive method of caring for such emergencies. They are readily adapted and the dentist can rely on their standing up indefinitely. As a matter of fact, the patient can chew on them only a few hours after treatment and they will withstand rough abuse thereafter.

Other Uses:



← **OPEN FACE CROWNS:** Later if the patient wants a more aesthetic result, it is a simple matter to make an open face crown by removing the labial.



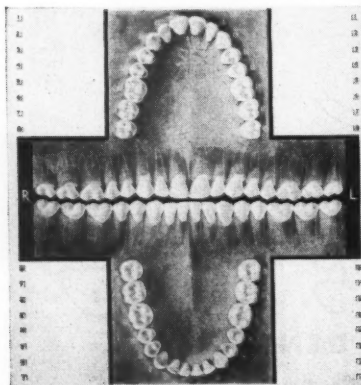
← **JUMPING CROSS BITES:** They are also proving very effective as a means of correcting locked anteriors.

If you wish a small Emergency Kit assortment of these crowns (only \$5.40), contact your dealer. If you wish additional information, just mail the completed coupon. We will be happy to send you a technical brochure.

ROCKY MOUNTAIN METAL PRODUCTS CO. BOX 1887, DENVER 1, COLORADO

Please send brochure on permanent Central Crowns

TO _____



Permanent Records Are Important...

Do you have a permanent record of the mouth of each of your patients? This type of record is tremendously important, and easy to accomplish. Use the Ryan Treatment and Examination Chart as illustrated here. It is being widely used and is acclaimed the most practical chart for record purposes. Use it on *one case* . . . and you will want to use it on *every case*. The coupon is for your convenience.

Dental Digest
1005 Liberty Ave., Pittsburgh 22, Pa.
Here is \$1.50 for a pad of 50 Ryan Examination and Treatment Record Charts.
Dr. _____
Address _____
City _____

Dental Digest

PUBLICATION OFFICE:
1005 LIBERTY AVENUE
PITTSBURGH 22, PENNSYLVANIA

MERWIN B. MASSOL.....Publisher
ROBERT C. KETTERER.....Publication Manager
DOROTHY STERLING.....Promotion Manager
S. M. STANLEY Vice Pres.-Eastern Manager
JOHN J. DOWNES.....Western Manager
DON HARWAY.....Pacific Coast Manager
CARL SCHULENBURG.....Southern Manager

EDITORIAL OFFICE:
708 CHURCH STREET
EVANSTON, ILLINOIS

EDWARD J. RYAN, B.S., D.D.S.....Editor
WANDA T. PICKARD, B.A.....Asst. Editor

Manuscripts and editorial correspondence
should be addressed to the Editorial Office.

SUBSCRIPTIONS—In the United States, Alaska, Canada, Cuba, Hawaiian Islands, Mexico, Puerto Rico, Central and South America, Philippine Islands: One year, \$5; two years, \$8.00; three years, \$11.50. Three-year subscription includes the chart book, *Visual Education in Dentistry*. Elsewhere: One year, \$5.75; two years, \$9.50; three years, \$13.75. Subscriptions payable in advance.

ADDRESS CHANGES—Please allow two weeks for address change to become effective; furnish old as well as new address.

PUBLICATION DATE—The magazine is mailed on the fifteenth of month of issue.

EXTENSION SERVICES—*Visual Education in Dentistry*, printed in full color, in DENTAL DIGEST page size. Includes 31 charts from the series, *Visual Education in Dentistry*. Prices: \$1 per copy to DENTAL DIGEST subscribers; \$2 per copy to non-subscribers; \$1 per copy with new subscriptions at the rates named above. *Ryan Examination and Treatment Records*, carrying an anatomically accurate chart with space for examination data, lithographed on durable paper of proper texture for crayon, pencil, or ink. Price: \$1.50 per pad of 50, punched for standard loose-leaf binder. *The Castle That Was Destroyed* (published in May, 1939). Price 100, \$15. *Your Teeth and Your Life* booklet. Prices: 20, \$1; 100, \$4. *Clinics on Paper* booklet. Includes 100 suggestions from "Clinical and Laboratory Suggestions" department; 64 pages. Price: \$1.50 to DENTAL DIGEST subscribers; \$2 to non-subscribers. Information upon request.

DISTRICT ADVERTISING OFFICES—
New York.....7 East 42nd Street
Chicago.....Peoples Gas Building
St. Louis.....Syndicate Trust Building
Los Angeles.....1709 West 8th Street

Dental Digest

Registered in U.S. Patent Office

MAY 1954**About Our****CONTRIBUTORS**

HARRY L. PAGE, a regular contributor to *DIGEST*, is a teacher, writer, and an acknowledged authority on the subject of prosthetics. Mr. Page continues his discussion of this subject in his article, **AN APPRAISAL OF BALANCE**.

RICHARD M. GRIMALDI, D.D.S. (Emory University, School of Dentistry, 1941) specializes in prosthetics. Doctor Grimaldi's article in the current issue is **USE OF MAGNETIC FORCES IN PROSTHETIC DENTISTRY**.

ELIAS LISMAN, B.A. (Washington Square College, New York University, 1939), D.D.S. (New York University, College of Dentistry, 1942) is a specialist in children's dentistry. Doctor Lisman presents the second installment of his two-part article, **FULL DENTURE CONSTRUCTION WITH STRESS ON ELIMINATION OF LABORATORY PROCESSING ERRORS**.

ROSWALD B. DALY, B.S. (Wake Forest College, 1947), M.D. (Bowman Gray School of Medicine, 1946) did postgraduate work at Yale University and served his internship at Episcopal Hospital in Philadelphia. In his years of general practice nutrition has been Doctor Daly's chief concern especially in the field of preventive medicine in relation to degenerative disease. As Director of Research at the Page Biochemical Foundation in St. Petersburg, Florida, Doctor Daly is well equipped to contribute the ninth installment of the series of articles appearing under the general title, **BODY CHEMISTRY IN HEALTH AND DISEASE**.

PAUL BOYENS, D.D.S. (College of Physicians and Surgeons, School of Dentistry, 1902) is a specialist in periodontics and dental medicine. Doctor Boyens has published a number of articles on subjects within his field of interest. The title of his current article is **INTESTINAL TOXEMIA AND PERIODONTITIS**.

An Appraisal of Balance <i>Harry L. Page</i>	200
Oxygen Therapy for Blood Donors—An Abstract	204
Use of Magnetic Forces in Prosthetic Dentistry <i>R. M. Grimaldi, D.D.S.</i>	205
Posture and the Dentition—An Abstract	207
Full Denture Construction With Stress on Elimination of Laboratory Processing Errors—Part Two <i>Elias Lisman, B.A., D.D.S.</i>	208
The Temporomandibular Joint in Vitamin C Deficiency (An Abstract) <i>Barnet M. Levy, D.D.S., and Robert J. Gorlin, D.D.S.</i>	214
Body Chemistry in Health and Disease—Part Nine <i>Roswald B. Daly, M.D.</i>	215
Clinical and Laboratory Suggestions	220
1. Self-curing Restorations. 2. A Bur Container. 3. An Impression for Fixed Bridges. 4. Eliminating Undesirable Display of Amalgam. 5. Lower Alginate Impressions. 6. Water Temperature Control for Alginates.	
The Editor's Page	222
Contra-Angles	230
Intestinal Toxemia and Periodontitis <i>Paul J. Boyens, D.D.S.</i>	223
The Meaning of Disease—An Abstract <i>Ram Sarup Nanda, B.D.S.</i>	224
Medicine and the Biologic Sciences	226
Dermal Sinuses of Dental Origin—An Abstract	234

EDWARD J. RYAN, B.S., D.D.S., Editor**WANDA T. PICKARD, B.A., Assistant Editor****708 Church Street, Evanston, Illinois**

Copyright, 1954, by Dental Digest, Inc. See page 196 for subscription data, etc.
The magazine is mailed on the fifteenth of the month of issue.

An Appraisal of Balance

HARRY L. PAGE, Valparaiso, Indiana

DIGEST

Recognizing that a persistent and general dissatisfaction must indicate a more important lack than that of technique or operating skill, current research has begun probing articulation principles. Three times during the past twelve years, the Chicago Dental Society's annual prize for the best essay on "new, significant material of value to dentistry" has been awarded to investigators^{1,2,3} who emphasized in their contributions that "glide," "condyle path inclination," and "balance" played no part in function or in the articulation of teeth. It would seem from this that unsatisfactory results are stimulating researchers to question standard concepts despite their appearance of invincibility.

This article tests the concept of "balance" objectively. The results disclosed may be startling to authorities who consider balance to be unchallengeable but should be gratifying to those who realize that a review of concepts is the direct approach to a solution of a problem.

Theory of Balance

That balance *must* depend entirely upon the value or lack of value of "glide" and the "condyle paths" is based upon the theory that all or most of the working teeth on both sides of the jaw are or should be in even, simultaneous contact throughout all lateral excursions and that lateral excursions or "glides" are an essential part of power function.

¹Kurth, L. E.: Mandibular Movements in Mastication, JADA 29:1769-1790 (October) 1942.

²Craddock, F. W.: The Accuracy and Practical Value of Records of Condyle Path Inclination, JADA 38:697-710 (June) 1949.

³Jankelson, Bernard; Hoffman, George M.; and Hendron, J. A.: The Physiology of the Stomatognathic System, JADA 46:375-386 (April) 1953.

Evolution of Concept—The source of such an improbable concept is not known although it seems reasonable to assume that it evolved from the now obsolete idea that there should be "three-point contact" between artificial dentures if they were to function successfully. A progression from three to thirty or more contacts appears logical. And despite the persistent inference of "Enter bolus, exit balance," balance has become so firmly entrenched in dental thought, language, and teaching that it is virtually exempt from analysis.

Interpretation of Balance—Granger⁴ epitomized the generally accepted concepts of lateral excursions, condyle paths, and balance in the following statement:

"In normal relation the closing muscles contract, and the condyle and meniscus unit slides back and up until it is braced in the trough of the fossa. From this position, the mandible closes through the bolus of food until the cusps interdigitate. From this working bite, the mandible slides back toward centric relation with the teeth in contact. The working condyle rotates and the meniscus slides medially, braced all the time in the trough of the glenoid fossa. The cusps slide past each other, gliding across the opposing marginal ridges and sulci, exerting an almost vertical pressure. The mandible returns to centric relation, opens again, and returns to lateral excursion in the open position preparatory to repeating the stroke."

This is a graphic description of an entire masticating stroke according to the best interpretation of balance. By studying and analyzing Granger's exposition, a clear idea of the positive or the negative value of balance in

⁴Granger, E. R.: Centric Relation, J. Pros. Dent. 2:168 (March) 1952.

articulation and function should be formed.

Qualification Required—Granger states that the final power application of the masticating stroke begins with one condyle in its fulcral position "in the trough of the fossa." Elsewhere in the same article he clarifies "trough" as meaning "... the top of the fossa." This appears to be an error in anatomy and physiology and should be qualified to avoid initial confusion.

Effects of Muscular Forces

With the exception of the posterior fibres of the temporalis which retrude the coronoid processes, upper rami, and the condyles only, all muscles of mastication tend to arc the body of the mandible upward and/or forward. With a bolus between the posterior teeth acting as a fulcrum and with the masseters and internal pterygoids applying power upward and forward between this bolus and the condyles, the latter would be forced to arc forward and out of their fulcrum if the bracing position of each condyle was "in the top of the fossa."

Statement Contradicted—It is realized that this contradicts Granger's statement in the same article that the condyles are pulled "... upward and backward because the muscles are attached to the mandible between the resistance of the bolus of food and the fulcrum of the condyle on the slanting path." Jaw physiology and the law of levers would appear to support the contradiction adequately, however.

Limitation of Condylar Movement—To prevent the condyles from arcing forward and out of their bracing positions, nature has provided the anterior slopes of the mandibular (not glenoid) fossae and has made these the fulcrum for the condyles both in preliminary and final power closure. The backward facing of these slopes overcomes the tendency of the condyles to arc forward and reduces

their power closure movement to simple rotation.

The Mandible in Functional Closure—The mandible body *never* "slides back" in functional closure. In the early phases of closure, the jaw fulcrum and hinge-axes lie in the mandibular angles where the latter are cradled by the masseter and internal pterygoid muscles. These muscles steady the jaw, arcing it upward and somewhat *forward* while the posterior fibres of the temporalis speed the condyles up and back along the fossal slope toward their hinge positions.

Shift of Fulcrum and Hinge-Axis—Once either or both condyles reach hinge position, the fulcrum and hinge-axis shift to the condyle or condyles while the masseters and internal pterygoids turn on the power. A bodily "slide" of the mandible is therefore impossible.

Preliminary Explanation—With the bracing position of the condyles and the nature of jaw closure properly qualified, the statement, "From this position, the mandible closes through the bolus food until the cusps interdigitate," can be analyzed. By "interdigitate" Granger probably means simple contact between the cusp tips only, for the cusps could never interdigitate until complete or nearly complete interdentation in closure had occurred.

Problem—The question now is whether or not the jaw can force the teeth through food, especially if it be tough, and bring the cusp tips both on the working and the non-working slides into *uniform, simultaneous, and equilibrated contact* ready to start the assumed balancing part of the final "glide" to so-called "centric relation." When this is carefully considered, it appears to be quite a difficult problem.

Absence of Contact in Chewing

Jankelson,⁵ emphasizing a total absence of tooth contact during chewing, stated, "Indeed, it cannot be stressed too forcefully that it was

only during the act of deglutition that functional contact of opposing teeth was demonstrated." An absence of tooth contact during chewing is obvious and readily understandable to anyone who knows something about the bulk moduli and viscosities of various foods and what their effect must be upon tooth interdentation. Teeth cannot, possibly, compress *any* food enough to attain and maintain tooth contact. Nor can they displace completely other than the most fluid of foods.

The Resistant Factor—Disregarding reflexes, it is conceivable that tooth contact *could* be attained if one were chewing jello. But among the more substantial boli, even chewing gum has sufficient resistance, both to compression and displacement, to prevent any but the most casual, accidental, and scattered tooth contact. In no sense would it constitute balance.

Slide Impossible with Teeth in Contact—If initial and uniform contact between the cusp tips in mastication cannot be achieved, it follows automatically that the mandible cannot "slide" *anywhere* "with the teeth in contact." If these supposedly functional glides with the teeth in contact cannot be made, the whole fabric of an articulation built upon lateral movements, condyle paths, and especially balance, falls apart.

No Evidence of Necessity—Jankelson⁶ reports, "There is no evidence that balance of teeth in eccentric positions is a physiologic necessity, or that lack of balance is less conducive to masticatory function."

Attaining Balance with the Mouth Empty—Anyone who has a full complement of well-articulated natural teeth with occlusals not mutilated by grinding can readily test for balance. If he will protrude until his incisors are in contact edge to edge, he will find that his molars are completely and as a rule, widely, separated. He will find too that his cuspids on the working side or his molars on the nonworking side will force his remaining teeth completely out of contact when he engages in lateral excursions.

⁶Ibid., 46:386.

Cuspal Interference not Encountered—The same person will discover that he has not the slightest difficulty in snapping his teeth into simultaneous and full occlusion from any opening in any direction without encountering even the most minute cuspal interference. This indicates that his functional stroke does not consist of cusps "gliding across the opposing marginal [transverse?] ridges and sulci."

Balance a Myth—Rather than gliding, "with the teeth in contact," across the opposing ridges and sulci, the cusps skim by each other and on past the transverse ridges and sulci with no preocclusal contact. The foregoing being general conditions, it is safe to conclude that "balance" in normal natural dentition is a myth.

Fallacious Concept of Lateral Motions and Balance

Lateral motions are employed universally as the supposedly correct means of balancing an articulation. It will be pertinent, therefore, to show and to analyze the reasons for the actual results of these laterals.

Occlusal Apposition Shown—Figure 1 illustrates the occlusal apposition of upper and lower natural teeth immediately following a full mouth reconstruction. This case was done according to the precepts of one of the most scientific and precise lateral motion techniques in existence. There can be no question but that it was done thoroughly, carefully, and exactly. What the photograph shows is not intended as a criticism of, or a reflection on any person, technique, or instrument. It is intended to demonstrate conclusively and emphatically that the concept of lateral motions and balance is fallacious and ruinous both to articulation and to occlusion and that this will apply regardless of technique, instrumentation, operating care, or skill.

Teeth are Free of Contact—Note in Figure 1 that the posterior teeth are completely free of contact. In a previous article⁷ the same result was

⁵Jankelson, Bernard; Hoffman, George M.; and Hendron, J. A.: The Physiology of the Stomatognathic System, JADA 46:384 (April) 1953.

⁷Page, Harry L.: Natural Articulation Movements, DENTAL DIGEST 59:203 (May) 1953.

depicted in an artificial upper and lower that had been milled in the patient's mouth. Since the jaw motions (laterals) used in milling were identical with those dictating the articulation of the full mouth reconstruction shown here, no other result could be expected or possible.

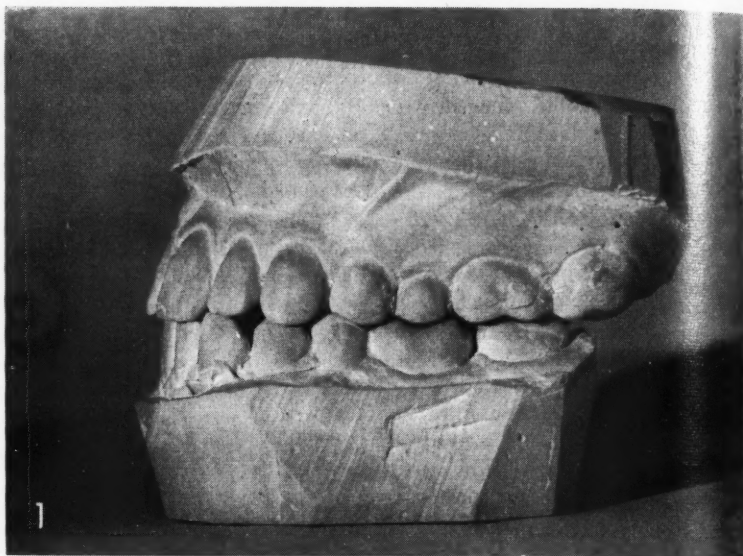
Situations Confused—The objection will be made immediately that models occluded freely by hand have no significance. Two entirely unrelated situations are being confused. It is true that occlusion attained by the hands alone does not signify that it will be repeated by the head. *When, however, occlusion cannot be accomplished freely by the hands, no mouth will do any better.*

Why Lateral Motions Can Never Produce Balance—Figure 2 shows a duplicate of upper and lower denture bases with wax occlusion rims. They have been made by taking impressions and pouring stone models of the originals after the latter had been fitted and apposed properly in the patient's mouth.

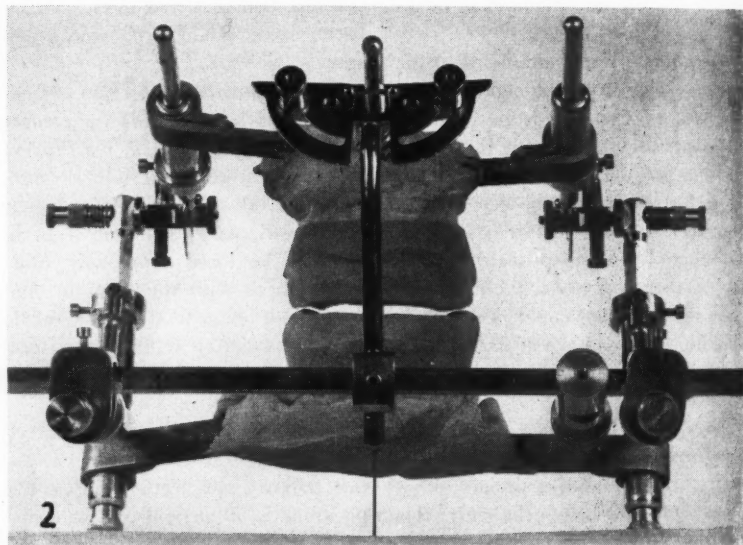
Contributory Factors Incorporated—All of the usual contributory factors such as equalized ridge loading, vertical dimension, occlusal tolerance (free-way space) and proper division of oral space between the upper and lower have been incorporated. Being set to the patient's own kinematic control centers, the hinge-axes, complemented by the cranial plan, the articulator (Transograph) provides a perfect reproduction of the patient's static and kinematic head relationships. Every lateral movement will, therefore, be the kinematic repetition of a like movement in the patient's head.

Determination of Condyle Paths—The condyle paths were determined and set by means of instrumentation that need not be explained here but which is a method that not only makes their precise transfer to the Transograph automatic but also fool-proof. The patient's head now has a mechanical counterpart on the bench and his static and kinematic jaw relationships can be repeated and studied at will.

Two Arbitrary Changes—Once the Transograph had been set, as de-



1. Effect of lateral motion technique on full mouth reconstruction. Posterior teeth lack contact in simple occlusion.



2. Stone duplicates of occlusion rims opened and condyle paths steepened deliberately in Transograph.

scribed, two arbitrary changes were injected: (1) the condyle paths were steepened materially over the patient's actual condyle paths. (2) The occlusion rims were separated appreciably as shown in Figure 2. These changes were made in order to give all the breaks to the lateral-motion-condyle-path-balance concepts. How completely they failed despite these aids is shown in Figure 3.

Condyle Paths Fail to Conform—Figure 3 demonstrates that the oc-

clusion rims that were deliberately parted while in normal occlusal position and that were given the added advantage of oversteep condyle paths so that any lateral movement might be expected to part them still farther, have failed wholly to conform. The instant reproduction of the patient's lateral jaw movement began, the occlusion rims on the nonworking side collided so violently that the anterior cranial plane rod was forced off its guide bar.

Normal Posterior Occlusion Absent

The contradictory function described indicates that a radial lateral (the stroke used universally in articulating by lateral motion) will grind the posterior occlusals together harshly on the nonworking side while the returning medial lateral stroke will release them entirely. A case articulated by laterals, therefore, *should* result in absence of normal occlusal contact at the posteriors. This has already been shown to be true in Figure 1.

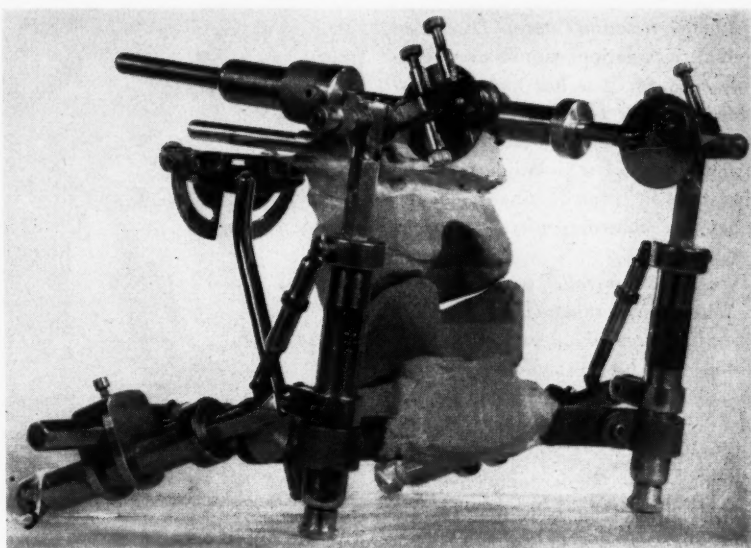
Experiment Extended—Figure 4 shows the same occlusion rims reset to perfect contact apposition just as they were in the mouth. The condyle paths have been readjusted to duplicate the respective head condyle path angles. It is now proposed to "glide" the models by lateral motions just as would be done by the patient's own jaws. This having been done, Figure 5 tells the story.

Gross Separation Shown—The stone models abraded each other viciously throughout the radial lateral and parted completely on the medial lateral strokes. As a result, the posteriors of the occlusion rims show gross separation when the models are returned to normal occlusal position. Again, there is the same result as that shown in Figure 1. Far from having been obtained by lateral motions, balance and occlusion have been literally ground out of existence.

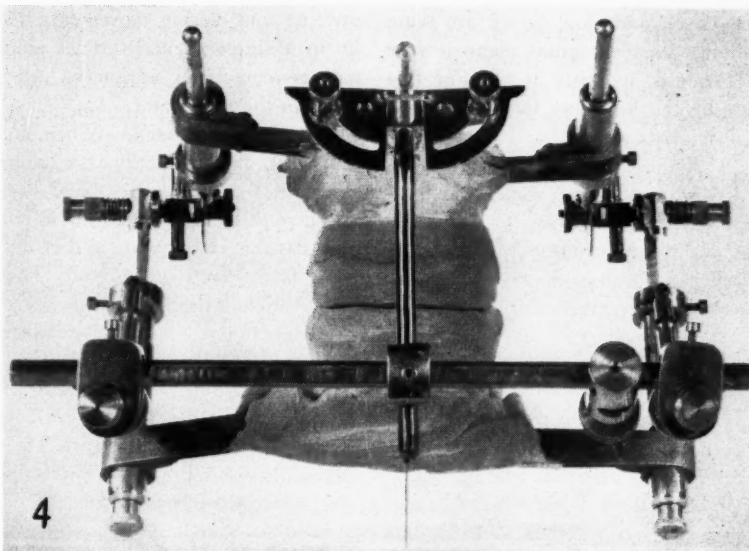
Possibility of Mouth Destruction—The inevitable conclusion of this demonstration must be that attempts to achieve balance in natural teeth by shaping the occlusals to the dictates of lateral motions will result in dangerous malocclusion and malarication. The results of such techniques may *seem* to eliminate pathology but are more likely to prove but temporary alleviations leading eventually to worse mouth destruction. If this be the case with natural teeth, it can hardly be otherwise with artificial dentures.

Natural Concepts of Articulation

Articulation concepts should be based upon natural, functional jaw movements rather than upon artifici-



3. Right lateral. Left posterior rims collide. Right rims stay free. Plane rod (front) forced from cross arm.



4. Occlusion rim and condyle paths reset to correct head relationships.

ally induced, and nonfunctional laterals. In the last twelve years the evidence against the latter has become overwhelming. In this day of atomic fission, radar, and television, it is ridiculous to argue that no instrument can be made that will duplicate natural, functional jaw motions. Rather it should be admitted that it *cannot be done with the concepts, techniques, and instrumentation advocated by present teaching*. But with an ordinary knowledge of temporomandibular joint physiology and func-

tional jaw synergy, success is only a matter of applying simple mathematics.

Kinematics Defined—All jaw function, from the instant the mandible starts to open until it returns to final and immobile occlusion, is *kinematics*. Kinematics is the study and control of *bodies in motion*. No part of jaw function or motion can be controlled by centric relation. Centric relation is static; a stationary position; only one of an infinite number of static positions assumed by the jaw.

Centric Relation Concept Discarded

—Centric relation cannot even control itself for it is lost and is superseded by new centric relations with every infinitesimal movement of the mandible. Centric relation must be discarded in favor of hinge-axes; the kinematic control centers of power function.

Positions Controlled by Hinge-Axes

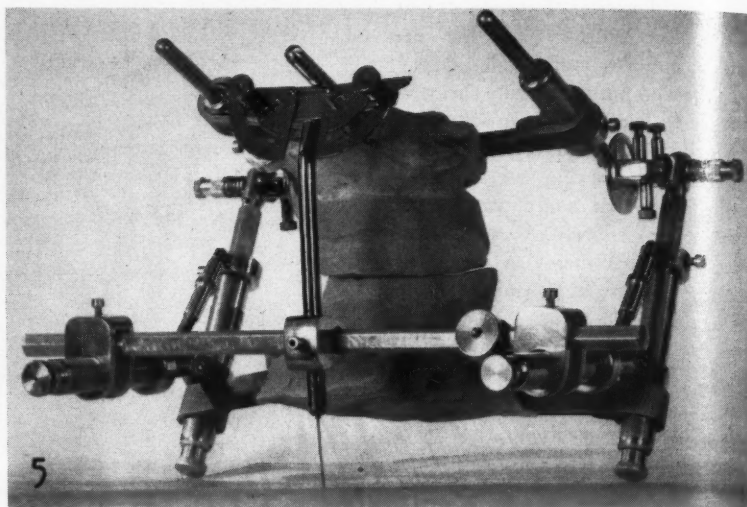
—Within hinge range (approximately 20 millimeters of opening at the incisors) the hinge-axes control every possible jaw position in the sagittal plane. This includes control of centric relation itself, for without the hinge-axes and their complementary cranial plane, there can be no centric relation. However, while the hinge-axes are prime requisites, they are far from being enough.

Factors Involved—The jaw that can open and close on an arc lying wholly in one sagittal plane is rare if, indeed, it exists at all. For this reason the following factors must be considered:

1. Natural jaw and condylar asymmetries will inject small collateral movements; bodily twists and shifts of the mandible, resulting in what is known as the Bennet movement. It is necessary to capture and include these in the synergy.

2. The patient's normal chewing closure angle in the transverse-vertical plane must be determined and coordinated.

3. Finally, a cranial relation (cranial plane) must be established in the head and be transferred unchanged to the instrument. Otherwise, all except



5. Abrasion resulting from right laterals. Left posterior (non-working) rims out of contact in simple closure.

opening and closing movements that lie in a single sagittal-vertical plane will be completely erroneous when made in the articulator.

Transference Possible—When, but not until, these functional relationships and movements have been caught and transferred to an instrument capable of receiving and of utilizing them, we shall, literally have "The patient's head on the bench."⁸ That functional movements can be duplicated has been a matter of record for some time. Students of transographics have been doing it consistently for the past four years. Their success, in every branch of corrective and restorative dentistry including

orthodontia, has become routine.

Summary

Balance and its two satellites, lateral excursions and condyle paths, have been checked by pertinent and readily understandable experiments. Balance has been found to be unnatural and impossible of attainment while lateral excursions are demonstrated as ruinous both to articulation and occlusion.

It has been noted that jaw function is kinematics and that the natural functional jaw motion must be and can be captured readily and be duplicated successfully through the use of new concepts, techniques, and instrumentation. Results have been exceptionally and routinely gratifying.

104 Garfield Avenue.

⁸Albinson, R. N.: Original Expression.

Oxygen Therapy For Blood Donors

DESPITE precautions and close checking of donors, temporary circulation and respiratory embarrassment does occur following the collection of a pint of blood. In the past, reliance has been placed upon such aids as elevating legs, inhalation of aromatic spirits of ammonia, artificial respiration, and even re-infusion of the donor's blood.

Since November, 1951 the Mercer Hospital, Trenton, N.J., has

had a portable oxygen cylinder with inhalation mask permanently assigned to the blood donor room. It is used on any donor who shows loss of palpable wrist pulse or other signs of severe shock following blood donation. Oxygen is administered at the rate of 10 liters per minute through a rebreathing face mask. This therapy for two minutes, or longer if indicated, brings about a rapid restoration of the donor's peripheral pulse, color,

mental clarity, and a general sense of well being.

To those who are responsible for the safety of the blood donor, and who wish to avoid the shock syndrome noted in occasional donors, the installation and use of oxygen therapy in their donor areas is recommended. A desirable method of combating the shock syndrome which is frequently encountered following the collection of a pint of blood is provided.

From *Oxygen Therapy News* 11: No. 5 (May 20) 1953.

Use of MAGNETIC FORCES

in Prosthetic Dentistry

R. M. GRIMALDI, D.D.S., Miami

DIGEST

This article presents a step-by-step procedure for placing small magnets in dentures as a means of stabilization. The conditions in which the use of magnets are indicated, factors involved in a successful technique, and the successive laboratory steps are described.

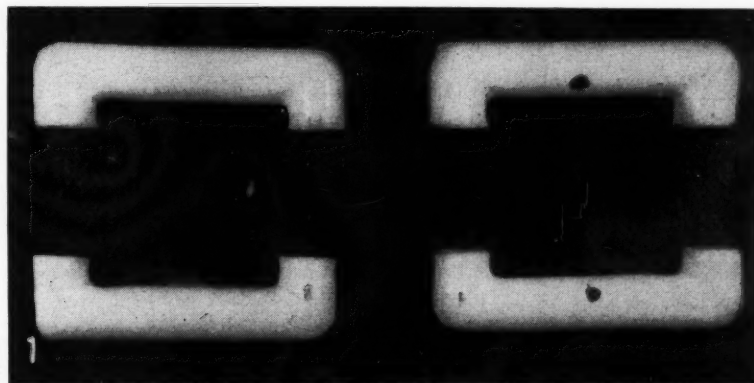
Improvement in Stability Sought

Since early days dentists have been trying to devise more satisfactory means of maintaining denture stability during mastication and the normal movements of the mouth. Expanding springs were first used to hold the upper and lower dentures in place but this device proved to be unsuccessful.

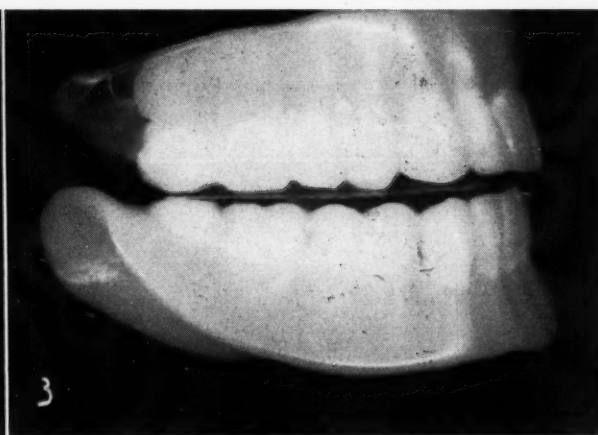
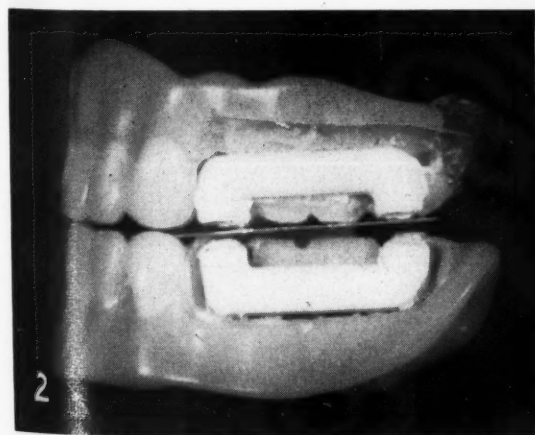
Progress in Technique and Materials—As better materials were developed, the trend was toward form-fitting dentures that were held in place by atmospheric pressure. The advanced techniques and materials seemed to be an answer except for the problem cases, which were unsuccessful because of the fact that certain mouth and ridge formations

did not lend themselves to adaptability. These cases could have been aided by surgery except for the patient's unwillingness to undergo alveoplasty.

Magnets Available—With the introduction of newer metals, alloys, and more advanced methods of magnetizing, small and powerful sets of magnets with the expelling force necessary to hold these dentures in place are now on the market. These magnets are small enough in size and weight that they do not hamper the denture in any objectionable manner.



1. Complete set of magnets.



2. Cut-away cross-section of magnets in place in the denture. 3. Completed denture.

Indications for Use of Magnets

In the opinion of the author the use of magnets in dentures is not recommended for the average case, but for the patient with the following conditions:

- a. Absence or abnormalities of ridge formation
- b. Soft and flabby tissue-bearing areas
- c. Abnormal muscle attachments
- d. Excessive gaggers
- e. Diabetic persons
- f. Accidental or war injuries where there is excessive loss of structure
- g. Congenital defects
- h. Surgical deformities due to removal of malignant tissue.

Factors Involved in Successful Use

The success or failure of the case depends upon the following requirements:

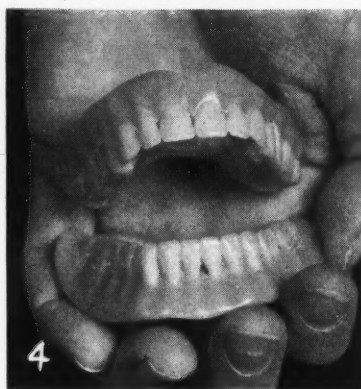
1. Position of the magnets in the denture
2. Strength of the magnet
3. Alinement of the magnetic forces
4. Distance between the poles
5. Lateral torque.

Laboratory Procedure

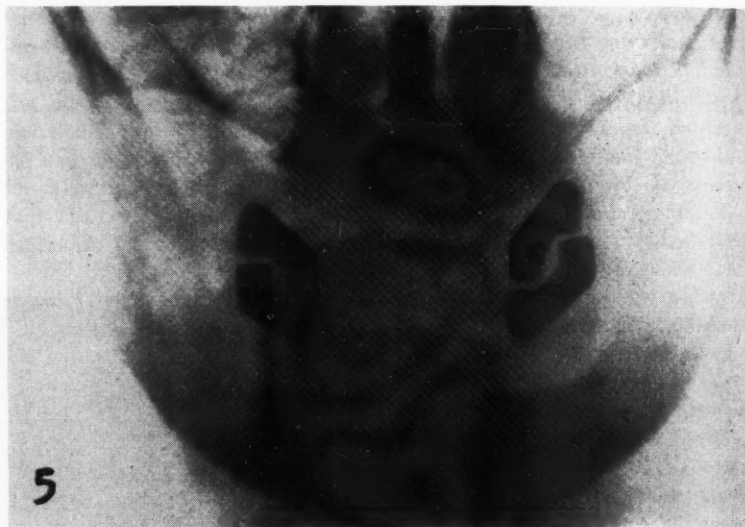
Type of Teeth—Plastic posterior teeth must be used. Teeth are selected for the esthetics and function best

suited to the individual case. Posterior teeth must be anatomic in form. Selection of the size of the magnet is determined by the mesial distal length of the posteriors. Magnets should be approximately 4 millimeters less than this distance.

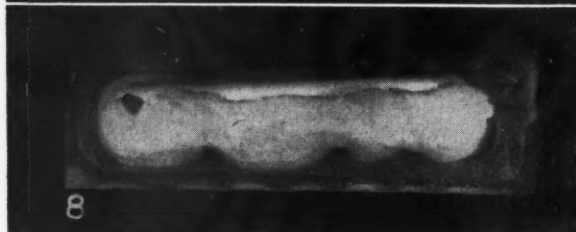
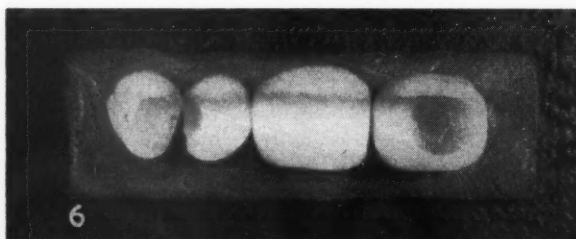
Preparation of the Teeth—The teeth are ground out by suitable means using stones and burs as illustrated in Figure 1. The magnet is placed in position as shown in Figure 2. Four groups of posterior teeth are prepared in the same way and separated into left and right sets, upper set, and lower set. Care must be taken to arrange



4. Operating distance and repelling force of magnets.

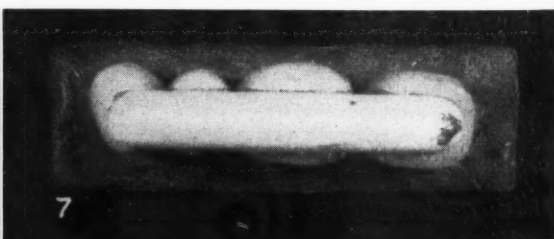


5. X-ray of completed case with magnets in position.



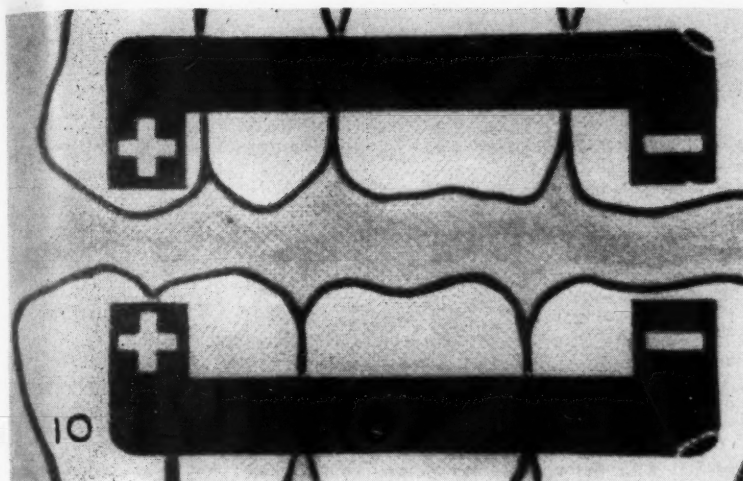
6. Prepared posteriors for magnets.

7. Magnet set in prepared teeth.



8. Magnet set in prepared teeth with the addition of cold-curing acrylic.

9. Completed set.



10. Diagram of magnetic fields.

these magnets so that they will be facing each other, North to North and South to South, in order to exert a repelling force as illustrated in Figure 5. In other words, all four magnets should have their south poles distally pointed.

Setup and Finish—Quick-setting acrylic liquid and acrylic powder of the denture material to be used in the finished case are employed to attach the magnet to the teeth as illustrated in Figure 3. Figure 4 shows the section ready for waxed setup. This section, plus the other three, is set up in wax using routine technique. The case is tried, invested, and processed in the usual manner.

Recharging Necessary—Over a period of time these magnets will weaken, necessitating recharging. This can be accomplished with an induction machine without removing the magnets from the teeth in a matter of minutes during a routine office call.

Conclusion

No adverse comment concerning this constant force in the patient's mouth has been brought to the author's attention, but on the contrary patients welcome the secure feeling and relief from tension previously experienced by insecure dentures.

1856 S. W. First Street.

Posture and the Dentition

WHEN MAN assumed the upright posture modifications in the design of the head and neck were necessary. It is only in the plan of the upright posture that the mouth is let into the ventral surface of the pharynx and is

surrounded by the superior constrictor-buccinator muscular ring, which arrangement lends support to the teeth and influences the form of the arches. It is only in this posture that the teeth are arranged in continuous

series, thus gaining support by the continuity of their contact points, and bone is partially relieved of its responsibility to support the teeth. This relief lessens the mass of bone and gives man his refinement of feature. Those who breathe through their noses have good dentitions and large airways, and those who breathe through their mouths have notoriously bad dentitions and smaller airways. When children attend for periodical examination the inspection should include a study of the poise, carriage, and physical condition. X-ray head plates are instructive and indispensable. The poise of the head on the vertebral column; the study of the airway, i.e. freedom from air blockage due to adenoid growth; the condition of the nasal cavity and its sinuses; the relative position of the tongue, mandible, and hyoid bone; the closure of, or failure to close off, the mouth from the pharyngeal airway by the soft palate and tongue; are conditions that can only be seen in x-ray head plates, and they must be known before an attempt is made to distinguish cause and effect, and before planning treatment. Malocclusion is the result not the cause of developmental drift. As a result of reestablishing nasal breathing by the use of the oral screen or Andresen plate, the teeth in many instances assume their normal positions, adenoids disappear and a normal airway is developed. By treating the cause and not the symptoms, the child is spared apparatus and surgical interference. Intelligent interpretation of x-ray head plates makes it possible to anticipate developmental drift, prevent facial deformity, and develop a healthy child. In the past the object of dentistry has been the treatment of disease, but the time will soon come when its object will be child development.

From *British Dental Journal* 95: 248 (Nov. 17) 1953.

FULL DENTURE Construction

With Stress on Elimination of Laboratory Processing Errors

Part Two

ELIAS LISMAN, B.A., D.D.S., Irvington, New Jersey

DIGEST

This is the second of a two-part article which gives step-by-step directions for a procedure in full denture construction which ensures the maximum of cooperation and accuracy by the commercial laboratory.

Fifth Visit Procedures

The patient returns for this visit to complete the final arrangement of the teeth for esthetics. At this visit a consultant, preferably the patient's husband or wife, or any close friend or relative who knows the patient and the patient's appearance well, and whose opinions and advice will carry weight with the patient, should be present.

Esthetics Approved—The patient is asked to approve the size, shape, and color of the teeth. The dentist then arranges the six upper and lower anterior teeth to fulfill the esthetic requirements of the case. When the pa-

tient, consultant, and the dentist are satisfied with the appearance of the patient with the teeth in place, the patient is dismissed. The balance of payments due should be completed at this visit.

Anterior Teeth Not Moved—The cases are returned to the laboratory for the final arrangement of the posterior teeth and the wax-up. The anterior teeth are not moved from the position established by the dentist and the patient. The finished setup and wax-up is returned to the dentist for approval before processing (Figs. 20 and 21).

Upper Denture Processed First—

1. Stone is poured into the tissue side of the denture base.

2. The upper acrylic base and teeth set in wax is now flaked in the usual manner and the wax eliminated.

20. Completed wax-up, left side.

21. Completed wax-up, right side.

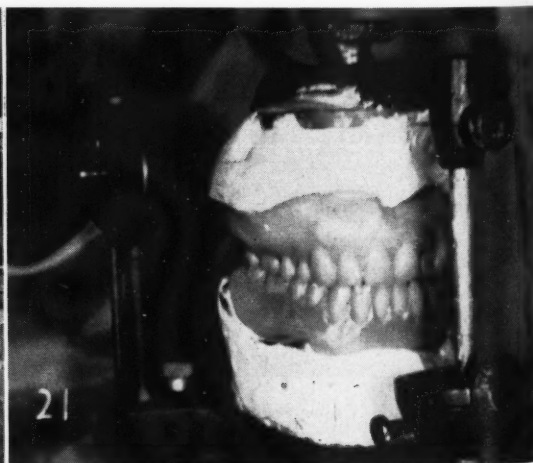
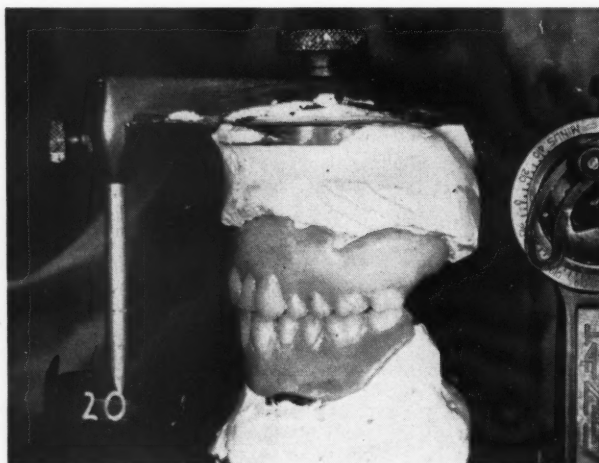
The flask is never heated to the boiling point of water. The temperature is kept as low as possible during wax elimination to avoid warpage of the acrylic base.

3. After the flask is separated and cleaned, a groove is cut into the denture base on the buccal and labial surfaces (Fig. 22). This groove is V shaped, 1 millimeter deep and 1 millimeter from the denture border.

4. A similar groove is cut on the palatal surface 5 millimeters from the crest of the ridge. The groove is cut with a sharp cylindrical bur. This groove serves as a finishing line for the acrylic which will be added to the denture base to hold the teeth and replace the wax which was eliminated.

5. Cold-curing acrylic is processed onto the denture base, first wetting the surface with monomer. If the groove is sharp and even, and close to the border, the junction of the new and old acrylic will not be flaky, and will be barely visible when the denture is polished.

6. The processed upper denture is removed from the flask and polished.





22. Upper case flaked, showing peripheral groove.

It is replaced on the plaster model, which has never been removed from the articulator. The denture should fit onto the model perfectly, since no heat was used in the second processing, and no warpage should take place.

Disturbed Articulation is Corrected—It will be noted, however, that the articulation may have been disturbed somewhat (Figs. 23 and 24). Some of the teeth may have moved slightly in the second processing. If this has occurred, the lower posterior

teeth, which are still in wax, are reset to articulate with the uppers, and centric relation and occlusion is re-established (Figs. 25 and 26).

Lower Denture Processed—The lower base is now removed from the articulator and the following steps are taken:

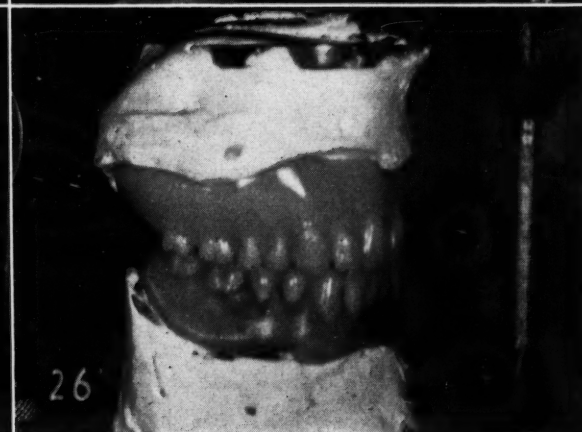
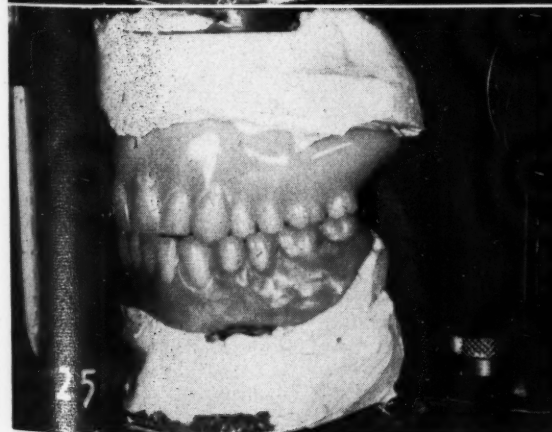
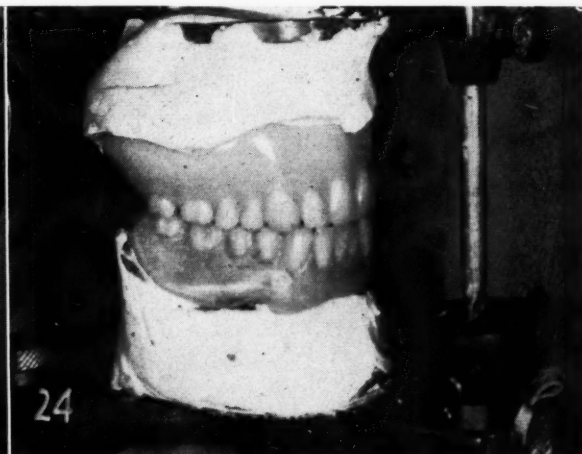
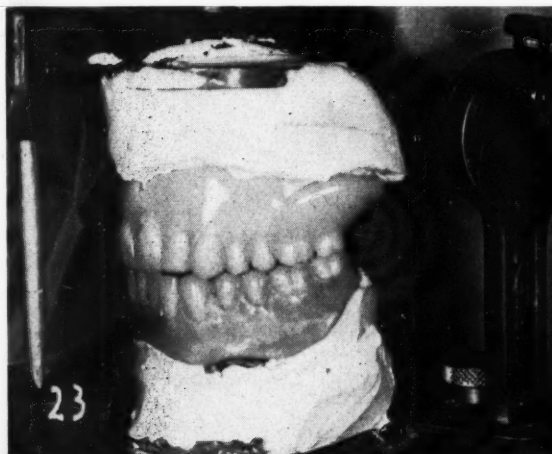
1. The tissue surface is filled with stone and the case flaked in the same manner as the upper.
2. After separating the flask and cleaning out the wax, the lower base is grooved all around the periphery,

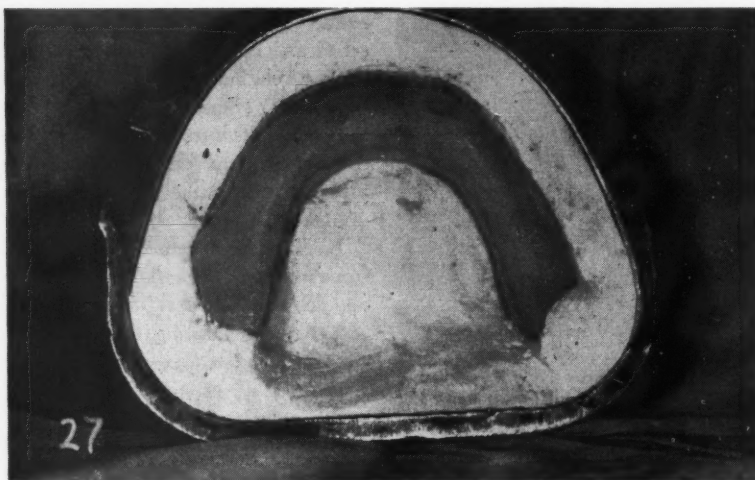
23. Upper denture processed and replaced on articulator before resetting lower teeth. Left side. Note faulty articulation.

24. Upper denture processed and replaced on articulator before resetting lower teeth. Right side.

25. Lower teeth reset and articulation corrected. Left side.

26. Lower teeth reset and articulation corrected. Right side.





27. Lower case flasked, showing peripheral groove.

1 millimeter from the border and 1 millimeter deep (Fig. 27).

3. Acrylic is cold cured against the original base.

4. The denture is removed from the flask and polished. It can now be resealed on the plaster model on the articulator.

Articulation Corrected to Upper Teeth—Little movement of the teeth is ever noted on the lower denture (Figs. 28 and 29). It is for this reason that the upper is processed first and the articulation of the lower teeth corrected to the upper.

Adjustments on Articulator—1.

The upper and lower polished dentures are resealed on the articulator in their original centric relation, and sealed to the models with sticky wax.

2. Occlusal balance and correction is undertaken according to the method of Schuyler¹ and Swenson.²

3. The pin is raised and centric occlusion is adjusted.

4. All centric prematurities are eliminated (Figs. 30 and 31).

5. Grinding is confined to the

¹Swenson, M. G.: Complete Dentures, St. Louis, C. V. Mosby Company, 1940.

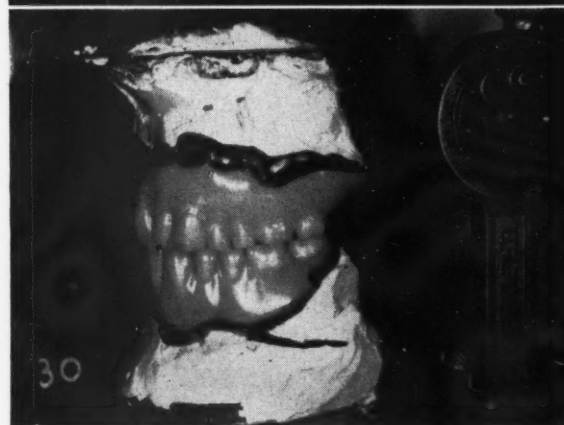
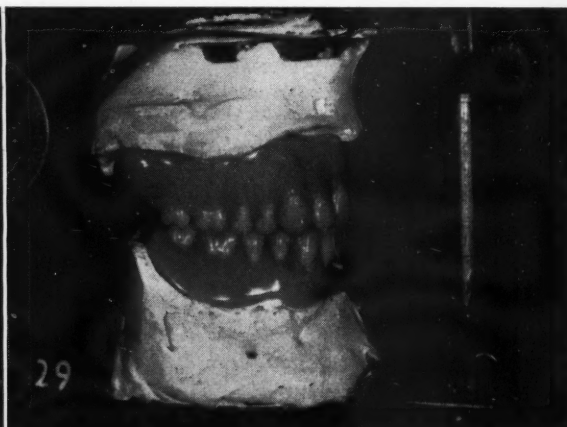
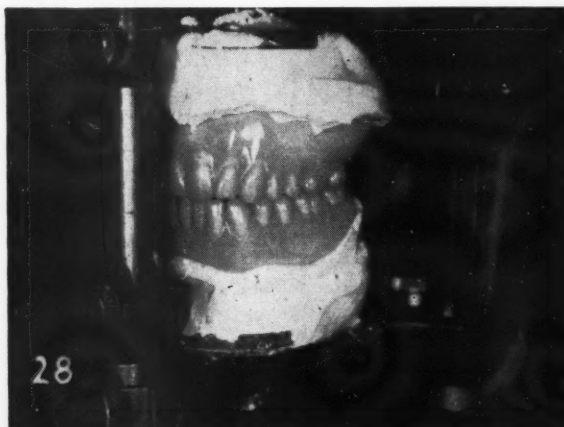
²Schuyler, C. H.: Fundamental Principles in the Correction of Occlusal Disharmony, Natural and Artificial, JADA 22:1191-1193, 1935.

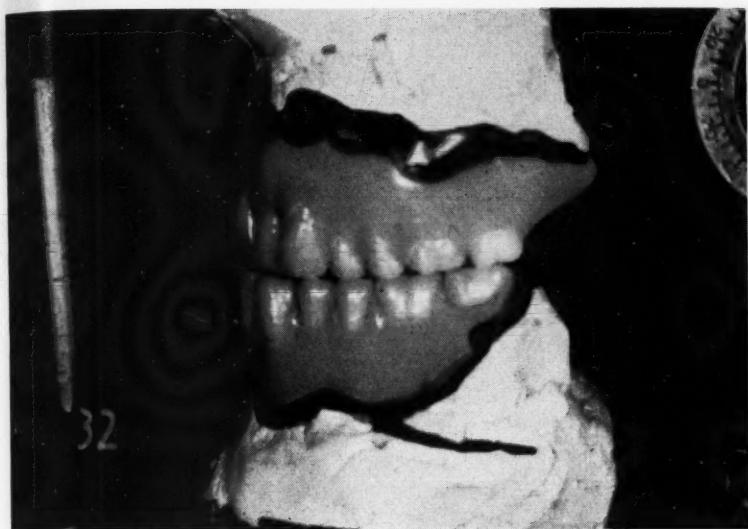
28. Lower denture processed and replaced on articulator, before balancing occlusion. Left side. Note absence of change in articulation.

29. Lower denture processed and replaced on articulator, before balancing occlusion. Right side.

30. Centric occlusion, left side, after selective grinding has been completed.

31. Centric occlusion, right side, after selective grinding has been completed.





32. Left lateral excursion, working side, after selective grinding. Pin is on table.

areas which are least needed in lateral excursions.

6. The fossa is ground if the premature cusp is needed for lateral balance.

7. The cusp is ground if that cusp is in premature contact in lateral excursions.

8. When centric grinding is completed the pin is again lowered to the

incisal table. It stays there throughout the remainder of the selective grinding procedures.

Lateral Excursions Adjusted—Figures 32, 33, 34, 35, and 36 illustrate the adjustment of lateral excursion:

1. On the working side, where premature contacts are noted, grinding is limited to the buccal cusps of the upper teeth and the lingual cusps of the lower teeth. These are the cusps which are not utilized in centric occlusion.

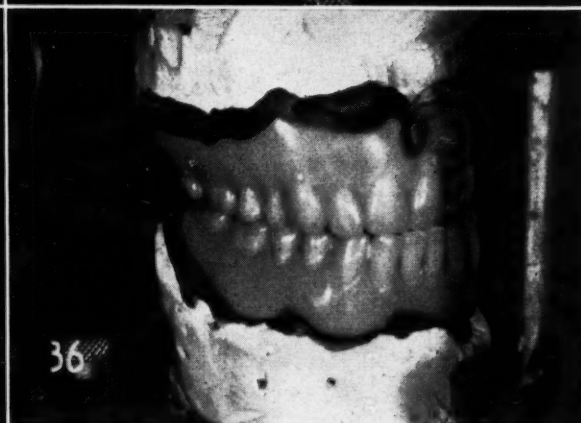
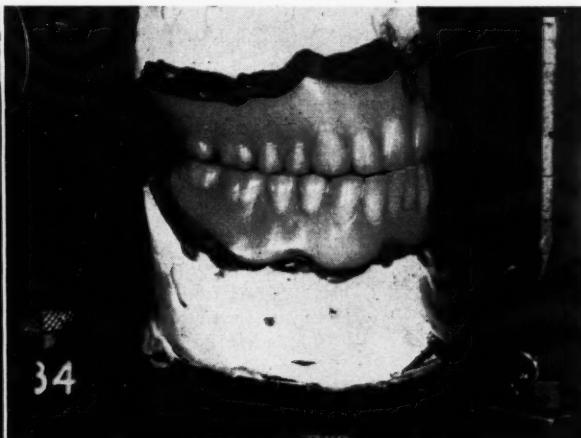
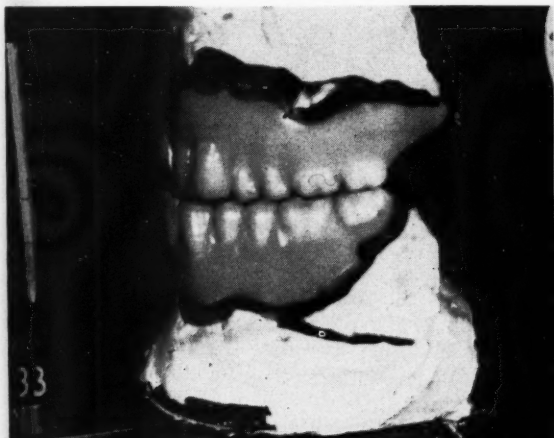
2. On the balancing side, the lower buccal cusps are ground rather than the upper lingual cusps, so that centric occlusal contact is maintained as

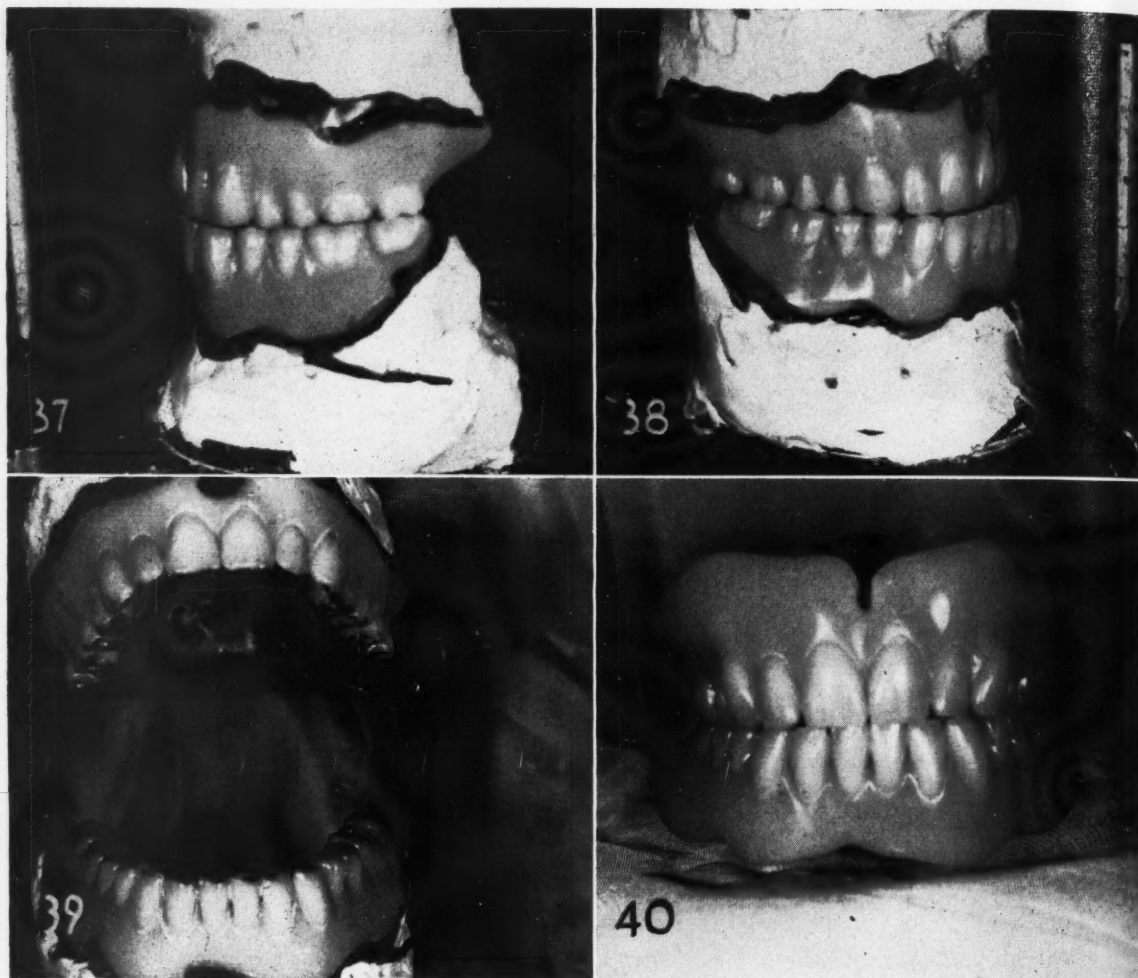
33. Left lateral excursion, working side, extreme position. Pin is still on table.

34. Right lateral excursion, working side, extreme position. Pin is still on table.

35. Left lateral excursion, balancing side, pin on table.

36. Right lateral excursion, balancing side, pin on table.





close to the crest of the lower ridge as possible.

Protrusive Excursions Adjusted—As shown in Figures 37 and 38, protrusive excursion is adjusted as follows:

1. The upper anterior teeth are ground within esthetic limits and the lower anterior teeth are then ground where necessary.

2. If the original setup was made with sufficient overjet and little or no overbite, little adjustment of the anterior teeth will be necessary.

3. The distal inclines of the upper posterior teeth and the mesial inclines of the lower posterior teeth are ground where necessary to achieve protrusive balance.

Final Steps—1. Final minute occlusal imbalances and irregularities are accomplished with the use of abrasive paste while the dentures are sealed to

37. Protrusive excursion, left view, after selective grinding, pin on table.

38. Protrusive excursion, right view, after selective grinding, pin on table.

39. Articulation open, showing carbon paper markings after centric closure.

40. Completed dentures. Finish line of second processing is barely visible.

the articulated models. No more than one dozen movements with light pressure should be needed for this.

2. Occlusal balancing is now complete (Fig. 39). The dentures are removed from the articulator and cleansed.

3. Occlusal anatomy is recarved into the teeth if necessary, and food exits reestablished.

4. The tooth surfaces are highly polished with fine pumice and a

brush on the laboratory lathe.

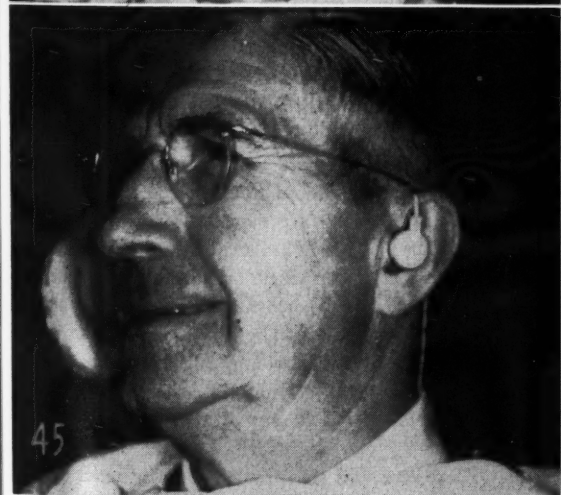
Sixth Visit Procedures

The dentures are delivered to the patient (Figs. 40, 41, 42, 43, 44, 45, and 46). No adjustment should be necessary at this time. The patient is shown how to insert and remove the dentures, and given proper home care instructions. This visit should not take more than fifteen minutes.

Advantages Noted in Finished Denture—1. The border extensions and muscle reliefs have all been previously checked and adjusted.

2. The denture is highly polished.

3. All tissue surface rough spots have been eliminated. There is no danger of "open bites" due to processing errors, since the casts have never been removed from the articulator after centric relation is determined.



41. Completed dentures in patient's mouth.

42. The patient without dentures.

43. The patient wearing dentures, front view, mouth closed.

44. The patient wearing dentures, front view, mouth open.

45. The patient wearing dentures, left view.

46. The patient wearing dentures, right view.

4. The use of acrylic bases ensures the maximum accuracy in intraoral records.

5. Balanced occlusion has been established in the laboratory before delivering the dentures to the patient.

6. Time-consuming border adjustments and polishing have been eliminated. The esthetics have been approved by the patient and consultant before processing.

Few Adjustments Necessary—The patient is instructed to return in two days for observation to determine if sore spots have developed on the tis-

ues. Another adjustment visit is rarely necessary. The patient is given a recall appointment for six months later. At that time, rebasing may be required if the dentures were constructed soon after extractions. The occlusal balance should be reexamined at this time, and adjusted if necessary, since occlusal imbalance is a most important source of soreness and ridge absorption.

Summary

The technique presented ensures a maximum of accuracy in full denture

construction by the commercial laboratory. It eliminates or compensates for inherent processing errors. The chair time of the operator is kept at a minimum since the time-consuming adjustments are made by the laboratory during the steps of construction. The patient is given esthetic, well-functioning, balanced dentures and the dentist is required to make a few postinsertion appointments. The basic principles of full denture construction are observed.

1034 Clinton Avenue.

The Temporomandibular Joint in Vitamin C Deficiency

BARNET M. LEVY, D.D.S., and ROBERT J. GORLIN, D.D.S.

Method Used in Investigation

Twelve young guinea pigs, each weighing 200 to 300 grams, were placed on a vitamin C-free diet. They were killed after two, three, and four weeks on the deficient diet. A few received injections of ascorbic acid after three weeks on the diet, and were killed three days later. The heads were removed, fixed in formalin, and decalcified by the formic acid-sodium citrate method. Block sections of the mandibular joint were removed, and serial sections for histologic study were prepared.

Normal Histology of the Mandibular Joint of the Guinea Pig

The condylar head is separated from the fossa by a fibrocartilage disc, which is covered on both sides by a single layer of synovial cells. The condyle is similarly covered by a synovial epithelium, under which is a thin fibrous layer. Beneath this layer is a zone of undifferentiated cells, which look like condensed mesenchyme and which we have called precartilage. This is demarcated from the zone of more differentiated cartilage cells which lies directly beneath it. A zone of hypertrophic cartilage cells extends evenly into the marrow cavity. There are many spicules of bone containing unresorbed calcified

cartilage matrix material covered by plump osteoblasts in the marrow cavity. Between the bony spicules a well-vascularized cellular marrow extends to the zone of erosion. Osteoclasts are present at the lateral portions of the head of the condyle, at the junction of the cartilage with the bone, and occasionally at the zone of erosion.

History of the Mandibular Joint of the Scorbatic Guinea Pig

After two weeks on the vitamin C-deficient diet there is an increase in the number of osteoclasts in the zone of erosion. In the subchondral area there are numerous fibroblast-like cells replacing the hematopoietic cells. Minimal hemorrhage into the marrow cavity is seen.

Cessation of Bone Formation—After three weeks on the deficient diet there is complete cessation of bone formation. At the zone of erosion, the cartilaginous matrix is calcified. This cartilage is separated from the marrow by an acidophilic structureless material.

Cartilage is Irregular—There are also numerous fractures of the calcified matrix material lying in disarray in the immediate subchondral area.

Marrow Replaced—The marrow in this area is replaced by connective tissue cells. There is a reduction in

the amount of hematopoietic marrow throughout the ramus, with large numbers of fibroblast-like cells replacing it.

Fractured Spicules Occur—In the narrow spaces are numerous fractured spicules of bone surrounded by focal accumulations of multinucleated osteoclasts.

Additional Changes — The lateral width of the ramus is reduced. On both sides of the meniscus one finds an acidophilic amorphous material, as well as an occasional red blood cell or lymphocyte.

Edema Present—Another conspicuous change is the edema of the muscle and periosteum. The muscle bundles are loosely grouped, and the individual fibers of the connective tissue are separated from each other. There are small hemorrhages between the muscle bundles, onto and beneath the periosteum, and into the marrow cavity. There is an occasional macrophage containing blood pigment in the edematous periosteum.

Changes Accentuated—After four weeks on the vitamin C-free diet, all of the previously mentioned changes are accentuated further. The edema of the periosteal connective tissue is so marked that it resembles mesenchyme. The subperiosteal hemorrhage is undergoing further resolution, as shown by the laking of red blood
(Continued on page 240)

BODY CHEMISTRY

in Health and Disease—Part Nine

ROSWALD B. DALY, M.D., St. Petersburg, Florida

D I G E S T

Dental medicine and general medicine are closely interrelated, being based upon the same principles of anatomy, physiology, and biochemistry. In order that dental tissues, which are functioning components of the total organism, be well nourished, it is essential to obtain good nutrition for the body as a whole.

In its broadest sense a study of nutrition is an extensive undertaking, involving physical, social, cultural, and economic phases. Some of the most important aspects of this branch of science are discussed in this article, particularly those related to degenerative processes, both dental and medical.

Nutritional Aspects of Dental Medicine

The word nutrition, as it is commonly used today, connotes a variety of interpretations. It is too frequently pigeonholed with the word diet, which, unfortunately, is often associated with faddism and cultism. Diet, however, is concerned with food elements or the building blocks for the nourishment of the living organism; whereas nutrition is a process involving the numerous phases of dietary utilization. These phases include both the anabolic and the catabolic steps of metabolism and are influenced by many factors, both endogenous and exogenous.

Degenerative Disease Widespread Among "Well-fed, Civilized" People

To understand the relationship between nutrition and disease requires little specialized knowledge, but much straight thinking. Facing facts sometimes stimulates an outflow of painful realities. But the fact that degenerative disease is rampant among the world's "best-fed" people today cannot be ignored. These "best-fed" people include physicians and dentists and their families. On the face of it any connection between dietary factors and these killer-diseases would thus be discarded; on closer scrutiny, however, we find that these diseases are not so prevalent among the less opulent, the less civilized, and the less "well-fed" people of other parts of the world. The oft-quoted work of Weston A. Price,¹ a pioneer in preventive dental medicine, substantiates this challenging observation.

Necessity for new Scientific Approach

The need for a new scientific approach should be sufficient to arouse serious scientists to a different investigational point of view, to free themselves from the intensive orthodox hunt for specifics to treat the symptomatic manifestations of degenerative processes.

Fragmentation an Effect of Scientific Progress—Josue de Castro, Chairman of the Executive Council, Food and Agriculture Organization

¹Price, Weston A.: *Nutrition and Physical Degeneration*, Huntington Park, California, Mission Press, 1950.

²De Castro, Josue: *The Geography of Hunger*, Boston, Little, Brown and Company, 1952.

of the United Nations, states, "The tremendous impact of scientific progress has produced a fragmentation of culture, and pulverized it into little grains of learning. Each scientific specialist has seized his granule and turned it over and over beneath the powerful lens of his microscope, striving to penetrate its microcosm, with a marvelous indifference to, and a towering ignorance of, everything around him."

Man an Organismal Unit—To envision a true perspective of man in his entirety, with his disease processes, we must reverse the swing of the medical pendulum of specialization, assemble the facts, and apply them to our basic knowledge of human physiology and to common sense. In the new approach the body must be regarded as a whole organismal unit made up of interdependent functioning parts, striving to adapt itself to the caprices of its environment.

Little Change in Basic Anatomy of Man—Our civilization is flourishing in a scientific era of technical discoveries. But is the human body able to keep pace with the rapidly changing environment thrust upon it by man's inventions? Man did not evolve within a period of generations. His evolution took place over a period of many milleniums. His basic anatomy and physiology have changed very little.

Dramatic Changes in Dietary Aspects—Within a few generations man's basic dietary elements have undergone a drastic change. The struggle for adaptation is going on, and all about us is seen the pitiful evidence of a losing fight.

Nature's Law of Return

Fundamental to an understanding

of good nutrition is the recognition of, and respect for, nature's law of return.³ This law states in essence that organic plant and animal matter must be returned to the soil if its fertility is to be maintained.

Results of Violation of Basic Principle—Violation of this simple and basic principle initiates the first step in this country's struggle with degenerative disease in both the plant and animal kingdoms. Soil, robbed of its essential trace minerals and life-giving humus, is unable to nourish vegetation to healthy maturity.

Plant Growth Stimulated Artificially—Resistance to plant blights is lowered by violation of this principle and potent chemicals are necessary to rescue sick crops from destruction. In order to stimulate the plants to quick growth and to increase the acreage yield, incomplete foods in the form of chemicals are scattered over the worn-out soil.

Health Incident Attributed to Three Factors—Sir Robert McCarrison, a British physician of renown, spent seven years in India in a place called Hunza looking without success for a single case of cancer. Some of these people live to be 110 years of age and die with their own teeth in their mouths. McCarrison attributes this excellent health to three simple factors absent in our regime: (1) They eat natural food (that is, unrefined), (2) grown on fertile soil, and (3) they eat it fresh. Can the dental and medical professions ignore such an observation as this? A clue is offered here to the basic etiology of degenerative disease. Posterity will suffer for present complacency, temerity, and professional myopia.

Chemical Farming and Food Refinement Forerunners of Disease

An evaluation of the facts reveals that man's mechanical skills are threatening his existence. Unfortunately, this also applies to the field of nutrition. Chemical farming on mineral-depleted soils yields inferior products which are often brought to maturity only through the aid of pes-

³Nichols, J. D.: A Concept of Totality, *The Texas Bankers Record*, May, 1952.

I am talking in such detail about this substance because of a small accident that happened to us at that time. I had a letter from an Austrian colleague who was suffering from a severe hemorrhagic diathesis (vascular type). He wanted to try ascorbic acid in his condition. Possessing at that time no sufficient quantities of crystalline ascorbic acid, I sent him a preparation of paprika that contained much ascorbic acid and the man was cured by it. Later with my friend, St. Rusznyak, we tried to produce the same therapeutical effect in similar conditions with pure ascorbic acid but we obtained no response. It was evident that the action of paprika was due to some other substance present in this plant.

Szent-Gyorgyi: *Oxidation*, Baltimore, Williams & Wilkins, 1939, pp. 73-74.

ticides. An abortive attempt is thus made to substitute incomplete synthetic supplements for those indispensable complex elements removed from already deficient foods by refining processes. Complete vitamins with their natural organically combined trace minerals and enzymes cannot be produced in the laboratory synthetically. If these vital substances were not essential for the proper utilization of the foods in which they are found, nature would not have put them there.

Commercial Expediency Cause of Conversion—It is the responsibility of practicing physicians and dentists to challenge the wisdom of converting complete foods into incomplete foods. The purpose of this conversion through refinement, bleaching, and chemical fortification appears to be for commercial expediency only. Any rational concept of ecology defies the sudden change of man's food elements from complete natural foods to refined and synthetically fortified ones without the expectation of resultant metabolic disorders.

Effects of Sugar Ingestion—The devastating effects of sugar ingestion on body chemistry⁴ have been demonstrated conclusively through blood analyses. Laboratory and clinical proof points to the relationship between increased susceptibility to infection and fluctuating blood sugar levels brought about through the ingestion of sugar and refined starches.⁵ Evidence is also available incriminat-

⁴Page, Melvin E.: *Degeneration-Regeneration*, St. Petersburg, Florida, Biochemical Research Foundation, 1949.

⁵Sandler, Benjamin: *Diet Prevents Polio*, Milwaukee, Lee Foundation for Nutritional Research, 1950.

ing the injudicious and excessive use of chemical vitamin supplements.

Value of Whole Grain Cereals—Clinical experience has demonstrated the superior value of freshly ground whole grain cereals not subjected to bleaching and artificial enrichment. Animal laboratory tests substantiate this clinical observation. That refinement of basic foods has cost us dearly in health has been proved over and over.

Teaching of Former Scientists Ignored—Unfortunately, we are often slow to accept and profit from the teachings and experiences recorded in the history of former investigators. The classic story, for example, of Christiaan Eijkmann's momentous discovery on the Island of Java where he had been sent by the Dutch government to find a cure of beri-beri which was exacting a heavy death toll, appears to have been forgotten. Eijkmann proved that it is a deficiency disease, caused by eating polished rice, and cured by eating brown rice.

Results From Loss of B Complex—It was later shown that removal of the B complex, and particularly of thiamin, in the refinement process was responsible for beri-beri.

Causes for Present Decimation Disguised—History also records examples of the decimation of local populations where monoculture and civilized foods were introduced into tribal communities accustomed to existing on locally grown natural foods.² Disguised in multiple subclinical deficiencies, the cause for the decimation occurring among our populace is much more subtle.

Increased Mortality from Degenerative Diseases—The advent of the antibiotics heralded a new medical era for our society. This addition to our therapeutic armamentarium established an unprecedented victory over the common infectious diseases. But accompanying this decade of progress in control of infectious disease, statistics reveal not a declining, but a steadily rising mortality from degenerative diseases. Nor is this increased mortality from degenerative disease altogether a relative one brought about, as is commonly thought, by increased longevity from the miracle antibiotics. It is taking its toll alarmingly from the age group representing the prime period of life,⁶ and from the most valuable contributors to society.

Dental Caries Outstanding Example of Systemic Chemical Imbalances

Heart disease and cancer are the two great death menaces today, but the most glaring and universal evidence of body degeneration is dental caries. Rarely is there a child found in school today who is free from dental caries. Indeed, it is not uncommon to find rampant caries in preschool age children. Any serious dentist or physician must see the futility of limiting treatment to the teeth or adjacent structures, or to the imbibition of some chemical.

Means of Correcting Caries—Only through the correction of the systemic cause can the progress of this degenerative process, as well as other degenerative processes, be checked. The means of correction is a challenge to the dental and medical professions. The method proposed is not simple. It requires the diligent efforts of both patient and practitioner. Correction also presupposes acceptance of all proved, workable procedures irrespective of source, which are fused in the common objective of benefiting man and contributing to his welfare.

General Pattern of Approach—The over-all approach is aimed toward the proper nutrition of every cell of the human body by whatever means is

It is the consensus among foremost thinkers that we must revise, reimplement, and frequently reverse the direction of trends in our politics, husbandries, economy, and food culture. Since the problem of nutrition encompasses the wheel of life, then a revolution in nutrition could and will profoundly influence every aspect of our way of life.

N. Philip Norman, M.D.: *American Journal of Orthodontics and Oral Surgery* 33:11, 1947.

necessary to establish a normal biochemical milieu *interieur*.

Proper Diet Sometimes Sufficient: A surprisingly large number of people are fortunate enough to reach a normal nutritional status through proper diet only; that is, a dietary consisting of the essentials and excluding the harmful nonessentials.

Alteration in Endocrine Balance Sometimes Necessary: In other cases which constitute an ever-increasing majority, in those cases where the degenerative processes have reached advanced stages, corrections of constitutional and hereditary liabilities is required before the patient can properly utilize the constituents of a good diet. A balancing of the endocrine system promises to be the solution in these cases.

Balancing of Endocrine System Essential to Good Nutrition

This system of ductless glands is the powerful governor of all body functions and controls the intricate metabolic processes. Knowledge of this highly organized, specialized, and interdependent group of glands is in its infancy. Many of its secrets are yet to be revealed. Doubtless, other important functioning members are yet to be discovered.

Reversal of Disease Process Possible—Sufficient data are now available to demonstrate that through the regulation of the endocrine glands a normal balancing of body chemistry can be obtained, and often a regeneration of diseased tissues be accomplished. Endocrinographs, as devised by Page, based upon variations of body contours, have contributed invaluable clues concerning specific endocrine needs.

Concrete Proof Available—Objective laboratory evidence, as well as clinical amelioration of symptoms,

presents concrete proof of the efficacy of specifically indicated hormones administered in physiologic dosages. Selective therapeutic doses of vitamin supplements of natural origin will often also bring about similar reversal of degenerative processes. The mechanism involved is not altogether understood, but the possibility of action through a hormonal control is postulated. Some evidence favors this possibility; also, it is known that vitamins are the hormones of plants.

Geriatric Aspects of Nutrition—Kountz,⁷ an authority in geriatric medicine, of the Washington University School of Medicine, wisely cautions against the injudicious use of endocrine substances; he states, however, that when nutritional substances such as vitamins, protein, and hormones are given in physiologic amounts, a patient's disease may not progress.

Tissue Function may be Restored—Kountz further emphasizes that these substances may restore a function to tissues that they formerly had and also give certain tissues an anatomic appearance closely resembling that of an earlier age. Important also is the fact, as he points out, that strong evidence is accumulating to suggest that nutritional factors of the body past midlife are the primary concern of health in later life; and that we may reverse chronic illness, as it is known today, by paying attention to such simple factors as anoxemia, endocrine balance, and the diet of persons past 40.

Hypoproteinosis a Clinical Entity

According to Lynch and Snively's report on hypoproteinosis,⁸ as well as the author's clinical observation, a recommendation for a high protein,

⁶Ryan, Edward J.: *DENTAL DIGEST* 60:33-37 (January) 1954.

⁷Kountz, William B.: *JAMA* 153:780, 1953.
⁸Lynch, H. D., and Snively, W. D.: *JAMA* 147:115, 1951.

sugar-free diet may be extended to the field of medical and dental pediatrics. The authors referred to reported a clinical syndrome often encountered among children: anorexia, failure to gain weight and to grow normally, irritability, frequent gastrointestinal disturbances, repeated bouts of infectious diseases, dental caries, and pallor.

A Simple Prescription—A prompt subsidence of these symptoms usually follows a simple prescription: high protein; sugar and milk-free diet. The common belief that milk is a necessary component of the diet beyond infancy to fortify the body against disease, including caries, is fallacious. On the contrary, evidence is accumulating which demonstrates actual harmful effects resulting from its excessive use.

Dietary Protein Essential — An abundance of "quick-energizing" refined carbohydrates is no substitute for this universal component of all living tissues. A protein deficit and carbohydrate excess lay the groundwork for disease. That protein is of prime importance to life is indicated by the derivation of the word from the Greek word "proteos," which means "of first importance." Next to water, protein is the most abundant body constituent, forming the matrix of the cells, cytoplasm as well as nucleus. It is inextricably involved in the maintenance of the integrity of the fluid compartments of the body as well as its tissues. Playing an important role in immunologic processes, it also enters into the composition of the enzymes without which life is impossible.⁹

Required Amount Varies—The required amount of animal protein intake varies (1) according to the established individual need, and (2) according to the quality of other dietary constituents; for example, fresh vegetables and fruits organically grown with a high vitamin and mineral content appear clinically to lessen the need for as much animal protein essential for the maintenance of a good state of health.

Sugar Not Essential—It is well

⁹Co Tui: *The Journal of Clinical Nutrition* 1:232, 1953.

The twentieth century has brought many changes in all spheres of life, and medicine has undergone them too. Not all have worked out to the good of suffering mankind, and it is unfortunate that medical common sense seems to have all but disappeared. The atomic age has changed scientific thinking, and only too often the aim is to do better than nature.

Joseph H. Isenstead, M.D.: *Modern Medicine* 22:4, 1954.

known in the medical and dental professions but is not easily comprehended by the laity that sugar is not essential in the diet as an energy food. This misconception probably stems from misleading advertisements. Protein and fat are able to keep a normal liver well supplied with glycogen, or animal starch, through glyconeogenesis.

Maintenance of Normal Blood Sugar Level—The liver's output of gamma glucose derived from glycogen maintains a normal blood sugar level of 100 milligrams per cent, provided the endocrine-regulating mechanism is functioning properly. Subnormal blood sugar levels, not produced by pancreatic islet tumor, are usually the result of (1) rebound hypoglycemia from sugar ingestion, or (2) disturbance of the sugar-regulating endocrine mechanism.

Relationship Between Fat and Calcium Metabolism and Some Common Degenerative Processes

An understanding of fat metabolism is one of the most pressing necessities of our time. When this problem is finally solved, we will probably have the answer to the etiology of a host of degenerative diseases. Correlation of the frequent concurrence of a certain endocrine pattern and certain disease processes (coronary sclerosis, cholecystitis, peptic ulcer, prostatism, hypertrophic arthritis) points toward a common etiologic factor.

Reversal of Degenerative Processes Possible—Correction of the endocrine imbalance through selective hormonal therapy frequently brings about a rapid reversal of these degenerative processes. Although less dramatic, a corrective dietary regimen, with supplemental vitamins and lipotropic agents, will often change the clinical

picture also. Great enlightenment of the metabolic link between the specific dietary elements and the endocrine control of body functions is suggested through a study of fat metabolism:

1. First of all, it is known that failure to supply essential dietary hormonal precursors definitely leads to physiologic, and later, anatomic deviations from normal which are passed on eventually as hereditary stigmata.

2. A dietary deficit of the phospholipids, and particularly the F complex fraction of the unsaturated fatty acids, fosters abnormal fat utilization. For lecithin is a member of this group, and it is a cholesterol antagonist.

3. Vitamin F is indispensable in calcium metabolism, lowering blood calcium by increasing its diffusion into the tissues.

4. In addition, the F complex, which is a synergist of E, participates in sex function. This might well be through a sex hormonal precursor mechanism. For we know that cholesterol is the mother substance from which all sex hormones are made.¹⁰

5. Also, cholesterol metabolism is influenced by lecithin. Since estrogenic hormone can often effectively lower serum cholesterol, could the ability of the phospholipids to do the same originate in an indirect hormonal mechanism?

Relationship Noted — Page has found a relationship between hyperandric (estrin-deficient) persons with abnormal calcium-phosphorus ratios and the degenerative processes enumerated. The author's clinical observation has pointed toward a high frequency of F deficiency in andric persons, frequently corroborated by endocardiographic tracings. The hypo-

¹⁰Perkins, Charles E.: *What Price Civilization*, Washington, Modern Science Press, 1946.

thesis of this specific dietary deficiency leading to an endocrine disturbance, if proved correct, indissolubly links vitaminology with endocrinology in the causation of certain diseases.

Choline Deficiencies Demonstrated

—Choline, an integral component of lecithin, has now been demonstrated to be deficient in man, according to radioactive tracer studies reported by Cayer¹¹ at the Bowman Gray School of Medicine. Such deficiency may be anticipated in chemotypes associated with strong expressions of Sheldon's endomorphic and mesomorphic somatotypes.

Deficiencies in Hypoposterior Pituitary Types—It might also be conjectured that Page's hypoposterior pituitary types will show a choline deficiency or deranged lipid metabolism, as it is observed that they frequently demonstrate a poor tolerance for fats. Blood and tissue levels of specific phospholipids have not been determined and correlated with the various endocrine types.

Biochemical Interpretation Aided by Endocrinotyping—Although there is an overlapping and intricate interrelation of many endocrine functions, it seems reasonable to anticipate quicker progress in biochemical interpretations when these laboratory analyses for phospholipids are carried out on subjects who have been endocrinotyped.

¹¹Cayer, D., and Cornatzer, W. E.: *Science* 109:613, 1949.

Specific Effect of Thyroid Deficiency on Vascular System

That we have at our disposal a simple clinical anthropometric method of determining the trend of thyroid activity, as well as that of other major endocrines, is important to the medical and dental practitioner, especially since it has been demonstrated that arteriosclerosis is so prevalent in hypothyroidism.

Arteriosclerosis Involved in Lipid Metabolism—Effective preventive measures could be carried out in thousands of cases if known clinical information were assembled, correlated, and applied by medical and dental clinicians to their patients. The frequency and severity of arteriosclerosis in myxedema is well recognized,¹² but these extreme hypothyroid cases, easily determined by routine methods, do not constitute the large majority of subclinical hypothyroid subjects.

Many Cases not Detected—A multitude of these cases are either never suspected clinically of hypothyroidism, or are exonerated by a misleading BMR. Gubner¹³ and Lange¹⁴ have shown that the increased permeability of the arterial intima and the loss of capillary strength in the media in hypothyroids are predisposing factors to lipid invasion. Furthermore, capillary integrity is restored in these cases by thyroid administration.¹⁴ If the anthropometric technique for de-

¹²Hurxthal, L. M., and Hunt, H. M.: *Ann. Int. Med.* 9:717, 1935.

termining endocrine patterns were routinely employed in the medical sciences today, many subclinical cases of hypothyroidism would be discovered and given the benefits of hormonal prophylaxis against arteriosclerosis.

Psychosomatic Factors

Not to be overlooked among the factors influencing body chemistry and cellular nutrition is the effect of human thought. Mind and body functions bear a strong reciprocal relationship. Simple clinical observation has demonstrated many times the importance of a calm and peaceful state of mind in effectively fighting disease.

Kinetic Energy Discharged from the Mind—Strong kinetic energy vibrations are constantly discharged from the mind, and, through glandular intermediaries, exert chemical reactions on body cells. Conversely, malfunctioning soma cells with impaired nutritive supply, whether from dietary, glandular, or mechanical cause, may produce a retrograde effect on cerebral function.

The Role of Cosmic Energy—Various forms of cosmic energy undoubtedly play an important role in human nutrition. A more complete scientific understanding of the power of these forces would add materially to our knowledge of body functions in health and disease.

2810 First Street North.

¹³Gubner, R., and Ungerleider, H. E.: *Am. J. Med.* 6:60, 1949.

¹⁴Lange, K.: *Am. J. Med. Sc.* 208:5, 1944.

We Can't Pay You, But—

NO DENTAL AUTHOR can ever be paid for a valuable technical or scientific article. The value of such material is above a monetary basis. In the preparation of a technical article, however, an author often spends money for drawings, photographs, models,

or graphs. We should like to help defray some of these expenses.

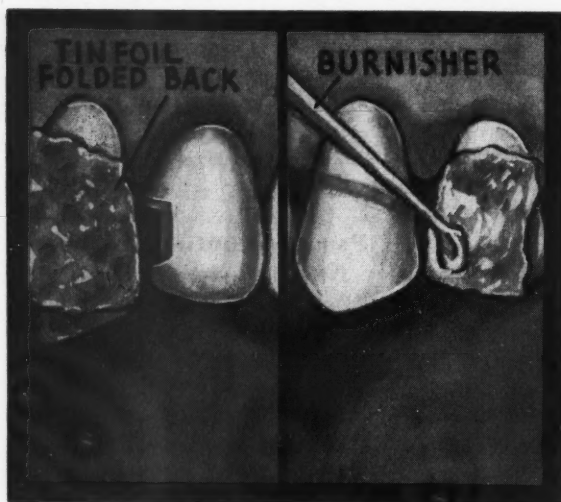
Until further notice, DENTAL DIGEST will allow \$25.00 toward the cost of the illustrations provided by the author of every article accepted.

If you have a constructive idea, an

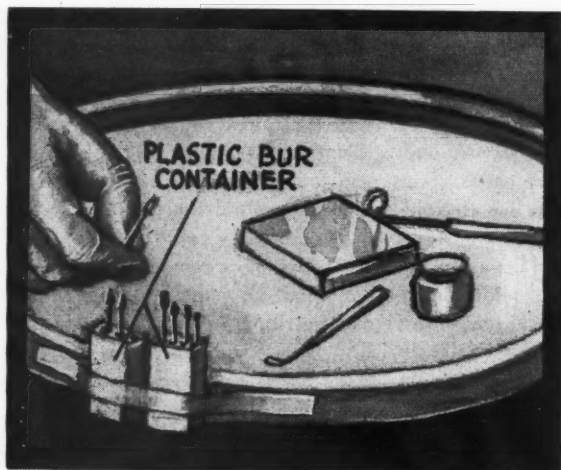
innovation, a new result of tried and proved experiment, put it down in writing, illustrate it, and send the material to: DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

We can make suitable black-and-white cuts from Kodachrome transparencies.

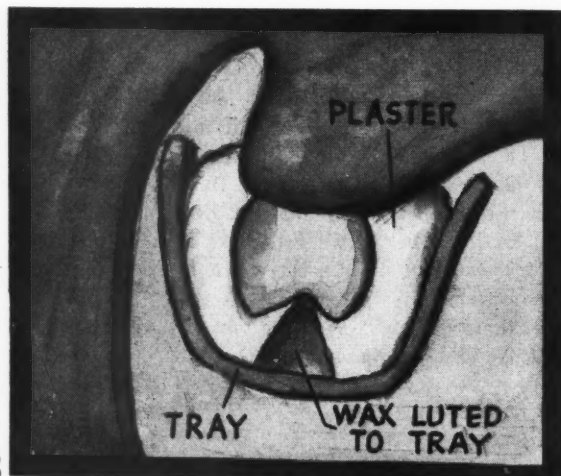
We hope that you will accept this invitation!



1



2



3

Clinical and Laboratory

Self-curing Restorations

George G. Ardito, D.D.S., Washington, D.C.

1. Acrylic cured against metal has a superior surface for polishing. Before painting an acrylic restoration, place a small piece of .001 tin foil in the interproximal space and fold against the proximating tooth. After the cavity is filled, lightly burnish the tin foil over the acrylic. A hard, glossy surface will result after the plastic has set.

A Bur Container

Alan R. Ettinger, D.D.S., Livonia, Michigan

2. To avoid reaching and fumbling for burs, especially when seated on an operating stool, attach two plastic bur containers to the side of the bracket with scotch tape.

An Impression for Fixed Bridge

Harry G. Mehl, D.D.S., MacDill AFB, Florida

3. When making a plaster impression of a fixed bridge with the abutment castings in place, the material and castings may be more easily removed and reset if the bridge tray is lined along its base with a long thin pyramid of wax.

READERS are Urged to Collect \$10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10.00 on publication.

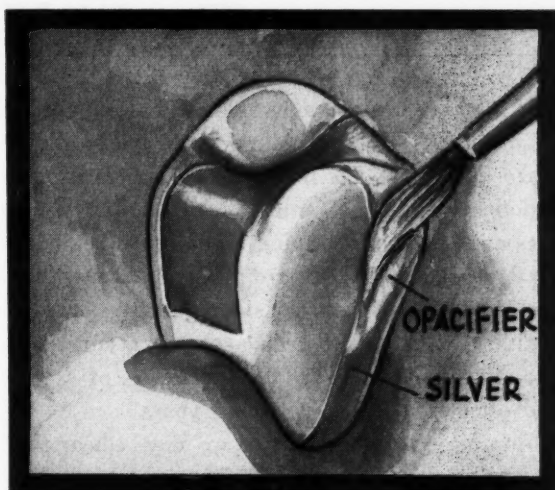
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Eliminating Undesirable Display of Amalgam

Joseph R. Markowitz, D.D.S., Bronx, New York

4. In a first bicuspid with a large MO amalgam extending onto the buccal surface it may be desirable to eliminate the silver color. This may be done by cutting a box on the buccal surface of the amalgam, painting an opacifier on the pulpal amalgam wall, and restoring with a plastic restoration. The brush technique is suggested. The use of the opacifier is necessary so that the underlying metal will not alter the shade of the acrylic restoration.



4

Lower Alginate Impressions

W. J. Simpson, D.D.S., Niagara Falls, Ontario

5. Take the upper impression first. Before pouring the lower model, fill in the area between the lingual flanges with the left-over alginate from the upper impression.

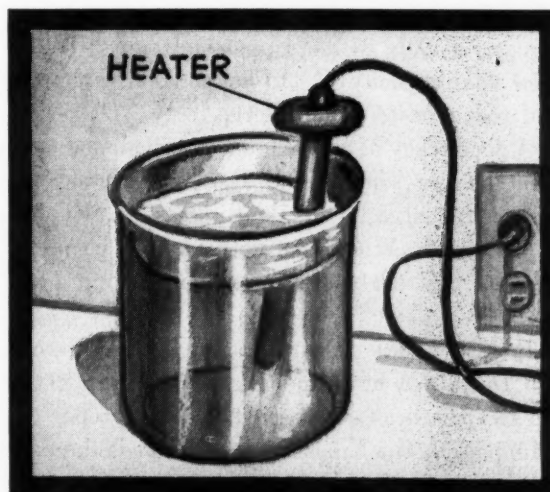


5

Water Temperature Control for Alginates

Solomon S. Seidenberg, D.D.S., Brooklyn, New York

6. A small regulated water heater immersed in a beaker of water will ensure a ready supply of proper temperature water for use with alginate impression materials.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 234 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

It is not a pleasant thought to know that *middle* life begins at 40. This applies to dentists and to a large share of our patients if we are not specializing in pedodontics or orthodontics. When we reach age 40 it is another way of saying that we are beginning the downward course toward physical degeneration. We may feel well and consider ourselves in good health. The fact is that changes are occurring in our vital tissues that are the precursors of serious and often fatal disease in later years.

As a more pleasant thought, we may be heartened by a publication¹ from the Division of Gerontology of the Washington School of Medicine in which the point is made that some of the degenerative changes are reversible:

"What, if anything, can be done about degenerative body changes has long been of concern. Some feel that the disease processes of old age are a fixed procedure, that nothing can be done once the tissues have degenerated, and that an infirm state of health must persist. Evidence that has accumulated at the Infirmary Hospital of St. Louis has definitely shown that this is not the case. It has shown that when nutritional substances such as vitamins, protein, and hormones are given in physiological amounts, the patient's disease may not progress. It has been shown further that the administration of these substances may restore a function to tissues that they formerly had and also give to certain tissues an anatomic appearance closely resembling that of an earlier age."

Most of us are reconciled to the loss or graying of the hair in middle age; to progressive dental disease, usually of the supporting tissues; to lowered vital capacity due to body tissue exhaustion and reduction of tissue reserve.

A good many of our failures in periodontal treatment and in some dental restorative procedures may be traced to factors that lie outside the tissues of the mouth. Within the field of body chemistry we may find the answers to many of our dental problems.

In the series of articles by Page, Brooks, and Daly, that have appeared in this publication the fact has been emphasized that the proper calcium-phosphorus balance of the blood is the dem-

onstrable indicator of the efficiency of the body chemistry. To achieve this efficiency Page recommends a sugar-free, white flour-free, milk-free nutritional program which in many cases is augmented by the endocrine supplements that are indicated, by vitamins, and the addition of trace minerals. Specific therapy for each person is determined from his anthropometric graph that shows his biologic history of growth and development and from exacting blood studies that reveal the present status of his body chemistry.

Kountz and Page are in fundamental agreement concerning the role of nutrition in relation to disease in persons past 40. These are the words of Kountz:

"It must be assumed that persons past middle age have certain deficiencies, and the recognition and correction of these deficiencies is highly important. It is necessary that changes be recognized at a relatively early period of life, just as the pediatrician recognizes the changes of growth and the need for growth substances and foods, as well as immunization, in childhood. It is believed, and I feel, that strong evidence is accumulating that nutritional factors of the body past midlife are the primary concern of health in later life and that we may lift the veil of chronic illness as it is known today by paying attention to such simple factors as rate of oxygen consumption or anoxemia, endocrine balance, and the diet of persons past 40.

"The diet should depend on the established physiological need of each person. A high protein intake consisting of about 1.2 gram per kilogram of body weight is important. No sugar is advised, including any food with a degree of sweetness that will raise the blood sugar rapidly. Most vegetables and fruits are considered important. Fat in the diet is desirable, particularly with moderation, up to 80 grams daily, depending upon the degree of overweight, if any. Addition of minerals, including calcium, phosphorus, and the trace minerals, are advised. Vitamins such as thiamine, riboflavin, and ascorbic acid are indicated to supplement the food intake in most persons."

The dentist who alerts himself to the many implications of body chemistry in relation to health and disease may find that he has expanded his sphere of influence.

¹Kountz, William D.: Therapeutic Aspects of Geriatric Medicine, JAMA 153:780-781 (Oct. 31) 1953.

INTESTINAL TOXEMIA and PERIODONTITIS

PAUL J. BOYENS, D.D.S., San Francisco

DIGEST

The case report in this article first focused the author's attention on general digestive dysfunctions as an etiologic factor in at least one type of periodontal disease. The data gained from examination of 100 students appear to verify the author's observations that there is more than a casual relationship between the presence of indican and certain kinds of periodontal disease and that various types of digestive disturbances can be prominent factors in influencing periodontal disease.

Case Report

A patient, a woman in early middle age, presented with an inflammatory type of periodontitis. She responded favorably to surgical treatment and the gingivae remained healthy for a number of years.

Recurrence—Suddenly, however, the patient developed arthritis accompanied by rampant recurrent periodontitis, including drifting teeth which had not occurred in the former phase of the disease. Her breath became notably offensive. She consulted several physicians seeking relief from arthritis.

Possible Connections Between Arthritis and Periodontitis—It seems reasonable to suppose that there was some close connection between the arthritis and the recurrent periodontitis, since focal infection is prone to produce metastatic lesions.

Improvement in Dental Condition

—More than a year passed before the patient returned for periodontal observation. Surprisingly, her dental condition had spontaneously improved in the interval, and the arthritis was gone. She stated that she had been under the care of a physician who had diagnosed and treated her for diverticulosis. We know that diverticulosis can produce profound disturbance in the physiology of the gastrointestinal tract. This factor was added to the considerations.

Gastrointestinal Symptoms in Periodontitis

Years of experience in periodontal practice have led to the observation that a large percentage of patients with persistent periodontitis show a generalized picture of gastrointestinal symptoms including the following:

1. Indigestion, gas, and distress after eating.
2. Some have lesions such as appendicitis, colitis, or gastric ulcer.
3. Many claim they have no appetite for breakfast, and many others eat between meals.
4. Midnight snacks and overeating are a commonplace in these diet histories.

Saliva in Periodontal Disturbances—Fosdick, Berg, and Burril¹ have shown that the saliva from a person suffering from periodontal disturbance will putrefy more rapidly than the saliva from a person with normal periodontal tissue. Also, in an article

by Berg, Burril, and Fosdick² we note that "Analysis of 100 patients with normal periodontal conditions and 100 patients with abnormal or pathological periodontal condition it was found that saliva from the pathological cases putrefied more rapidly than saliva from normal cases. The correlation is high between radiographic and clinical findings on the one hand and chemical findings on the other."

Presence of Indican—Concerning the digestive tract, in the *Textbook of Periodontia* Miller and McCall³ state that "On routine reports indican is usually listed. When present in excess (indicanuria) it is indicative of auto-intoxicational upset, often of unknown cause, in which stomatitis, gingivitis, or glossitis may occasionally be present, the increase in indican may be helpful in interpretation."

Indicanuria Evaluated as Diagnostic Aid

In view of the considerations cited it was thought worth while to evaluate the incidence of indicanuria in periodontal patients, and in (supposedly) healthy dental students. It was believed that indicanuria might be a helpful diagnostic aid.

One Hundred Patients Examined—Examinations were made of 100 patients presenting persistent generalized gingivitis (often hypertrophic), some with early bone destruction. Urine and blood examinations were done by H. G. Marquez, Ph.D., San Francisco.

Nature of Test—The test used for

¹Fosdick, L. S.; Berg, M.; and Burril, D. Y.: *Chemical Studies in Periodontal Disease*, vol. III, Putrefaction of Salivary Proteins, J. D. Res. 25:231-246 (Aug.) 1946.

²Berg, M.; Burril, D. Y.; and Fosdick, L. S.: *Chemical Studies in Periodontal Disease*, vol. IV, Putrefaction rate as an Index of Periodontal Disease, J. D. Res. 26:67-71 (Feb.) 1947.

³Miller, S. C., and McCall, J. O.: *Textbook of Periodontia*, ed. 3, Philadelphia, The Blakiston Company 1950.

indican was a modified Obermayer's test, carried out as follows: To 1 cubic centimeter of concentrated hydrochloric acid, add 8 drops of hydrogen peroxide, and 1 cubic centimeter of chloroform. Cork, and shake vigorously. If positive, the precipitate will have a blue or bluish color; the depth of the color indicates the concentration of indican present. It is more sensitive than many other tests.

Summary of Findings

Among the 100 periodontal patients the following table gives a summary of the findings:

	Tol. No.	Ex. Amt.	Mod. Amt.	Sl. Amt.
Patients Examined	100			
Indican	98	24	55	19
Secondary Anemia, Slight or Moderate	98	24	55	19
Central Pallor	90	23	51	16
Toxic Granular Neutrophils	71	18	39	14

Anisocytosis	57	34	17	6
Chronic Focal Irritative Base	39	13	22	4
Polychromatophilia	20	2	13	5
Left Neutrophilic Shift (Schilling)	13	3	8	2

Presence of Indican—In the 100 students whose urine was tested, 23 were positive for indican and 77 were indican-free, as shown in the following table:

Students	Indican	Amount
77	0	
8	3 or 4 plus	excessive
4	2 plus	moderate
11	1 plus	slight

Gingivitis in the Presence of High Indican—Ten of the 12 students with high indican were subsequently given a periodontal examination. Of these the following conditions were found:

Indican Group

Marked and generalized gingivitis	4
Moderate gingivitis	3

Slight gingivitis	1
Negative	2

Of the 77 students who were indican-free, seven were found to have marked or moderate gingivitis.

Conclusions

The data presented indicate that there is more than a casual relationship between the presence of indican and certain kinds of periodontal disease. They would also seem to verify the writer's conclusions over a period of many years that various types of digestive disturbances can be prominent factors in influencing periodontal disease.

450 Sutter Street.

Author's Note: Appreciation is expressed to Doctor H. G. Marquez for compiling and analyzing the numerous laboratory results. Also to Doctor Jean Cantou and Doctor Lowell Peterson of the periodontia staff of the College of Physicians and Surgeons who gave valuable service in procuring specimens from the students, is extended sincere thanks.

The Meaning of Disease

RAM SARUP NANDA, B.D.S., Denver, Colorado

Conclusions

1. Rigid classifications of disease are untenable.

2. Disease is always on a multifactorial basis and never due to a single cause.

3. There is no such thing as local disease. Disease is always systemic. There may, however, be local manifestations of a systemic derangement. Just because a lesion appears at a certain place in the body it should not be assumed that it is a purely local phenomenon. A patient allergic to some-

thing may get a rash on the body. This localized rash is not particularly of local origin, but a manifestation of systemic factors manifesting themselves in sharply localized areas.

4. Disease is not an entity.

Discussion

The concept developed in this article is that the approach to problems of dental disease needs revision. It brings out the fallacy of approaching the problems of dental caries and parodontal distur-

bances on a purely local basis. It emphasizes that research efforts should be directed toward a better understanding of the individual patient. It has important implications concerning our educational program. It clearly indicates that greater emphasis should be placed upon the teaching of biologic sciences. In fact, it raises the whole question of whether dentistry should exist as a separate discipline, or whether it should not be thought of as belonging within the family of medical specialties.

Adapted from *New York State Dental Journal* 20:60 (February) 1954.

here's

WHY

you should

SPECIFY

VERNONITE®

Realist

GEL



Vernonite "Realist" Gel produces by far the most natural looking dentures . . . dentures that actually defy detection in the mouth!

WHY? Because "Realist" Gel duplicates the color and texture of healthy mucosa. Furthermore, you can be sure that this naturalness will not vary from one denture to another because Vernonite "Realist" Gel is pre-mixed, pre-blended under scientifically controlled conditions at the factory . . . eliminating the chance of human error.

Now, when you add to this naturalness the fact that "Realist" dentures are stronger, lighter, better fitting and more durable you have the reasons WHY you should always SPECIFY Vernonite "Realist" GEL!

VERNON-BENSHOFF COMPANY • PITTSBURGH 30, PA.



Intraosseous Infusions

Usually the intravenous route is preferred when significant quantities of fluid must be given to a patient parenterally. Other routes must be used if the superficial veins are not accessible. This sometimes occurs in (1) obesity, (2) edema, (3) extensive burns, (4) circulatory collapse, or (5) other conditions.

The intraosseous route is one of the most useful methods available. In reality, it is merely another intravenous route. The vascular spaces of bone marrow communicate directly with numerous large veins emerging from the bone. Material injected into the marrow appears immediately in the general circulation.

Large volumes of blood, plasma, glucose, and electrolyte solutions can be given rapidly. Also, continuous infusions of heparin, antibiotics, anesthetic solutions and other drugs can be administered. Positive pressure may be necessary for the introduction of viscous solutions such as blood. Solutions of lesser consistency can be introduced at a satisfactory rate by gravity alone.

In an emergency, sternal, iliac, or tibial puncture can be performed rapidly with less equipment and less light than can surgical exposure and cannulization of a peripheral vein or artery. This factor assumes particular importance in civilian or military disasters.

A needle inserted in bone is more stable during continuous or repeated infusions than a needle in a peripheral vessel. It allows the patient greater freedom of movement. Insertion of a stilet into a needle between infusions prevents occlusion by clots.

Solutions of glucose or amino acids can be given safely and rapidly by intraosseous infusion, whereas these same solutions given by hypodermoclysis may cause oliguria and circulatory collapse in patients with dehydration, salt deficiency, or incipient shock. Only isotonic electrolyte solutions administered with hyaluronidase can be given rapidly

M E D I C I N E

and the Biologic Sciences



enough by hypodermoclysis to be of value in an emergency. Intraosseous transfusion does not jeopardize the circulation of distal parts. However, in some cases of deep shock, intraarterial transfusion may restore normal pressure when intravenous or intraosseous transfusion will not.

The potential hazards of intraosseous therapy have been reduced to a minimum by improvements in technique and equipment. The threat of secondary osteomyelitis has been largely eliminated by the use of strict asepsis and antibiotics when necessary. The possibility of producing embolism by forcing cortical fragments into the marrow cavity at the time of the initial puncture has been minimized by the use of a trephine-type needle, which removes intact a tiny plug of cortical bone rather than driving it inward. The hazard of perforation through the entire sternum or ilium due to too sudden or forceful a thrust of a pointed needle has also been eliminated by the use of the trephine needle which permits controlled pressure.

Intraosseous infusion has been found to be a useful alternative to peripheral intravenous therapy in em-

ergencies or in any case in which the latter is not practical.

Editorial: Intraosseous Infusions, JAMA 151:1108 (March) 1953.



Anxiety in Angina Pectoris

Serious danger confronts the patient with angina pectoris. He usually reacts as in other threatening situations. The effectiveness with which the customary defenses against anxiety can be utilized to determine the severity of the resultant apprehension. A satisfactory adjustment both to the disease and to the anxiety may be produced by psychotherapy.

Often the emotions accompanying the pain of angina pectoris are termed *angor animi*. They are variously defined: (1) as a sense of imminent disaster, (2) as an overwhelming fear of impending death, or (3) as an actual feeling of dying. The term is misleading because the anxiety is not specific or organically distinctive.

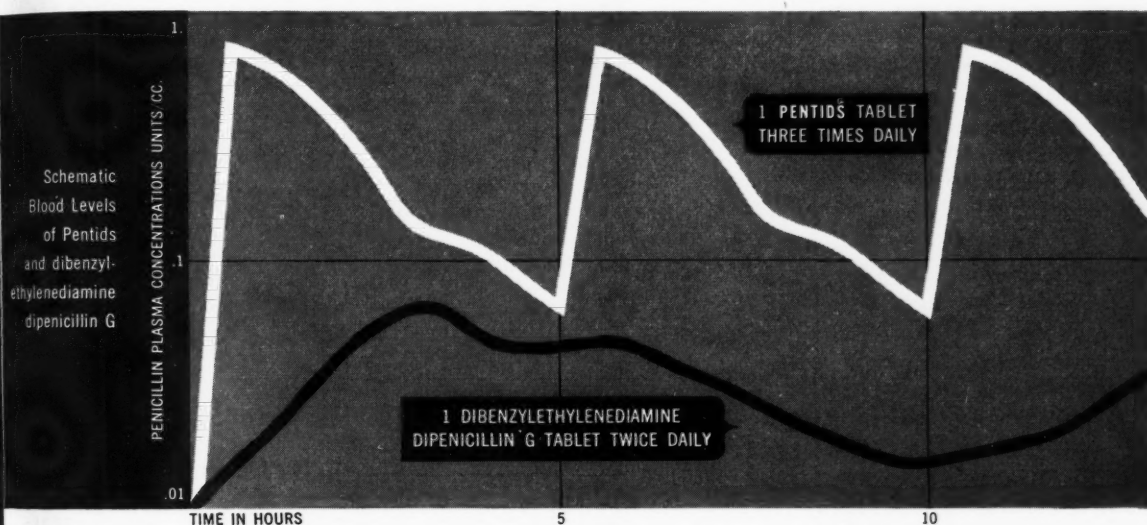
Studies of angina pectoris patients receiving psychotherapy show that dreams shed much light on the emotional reaction of the patient to the attack of angina which occurs during sleep. The dreams accompanying the angina reflect the unconscious meaning to the patient of an attack, regardless of the precipitating mechanism.

The intensity and the content of the emotional reactions to angina pectoris are determined by the previous experience of the individual and the current emotional state. This state varies from overwhelming panic to complete repression or denial of anxiety.

Fear of death is not always the emotion causing anxiety with angina. Abandonment and loss of love are also dreaded and may be interpreted as forms of punishment for conscious or unconscious aggressive wishes. Anxiety over the real danger of death from angina may be woven into pre-existing neurotic patterns, particularly feelings of guilt.

Any awareness of a threat to the heart readily precipitates anxiety.

the dentist like the physician . . . wants optimal results from penicillin therapy



*just 1 or 2 Pentids Tablets three times daily
as adjunctive therapy
for the more common dental infections*

Pentids are particularly effective as adjunctive therapy for acute oral Vincent's disease, pericoronitis, alveolitis, dento-alveolar abscess, cellulitis, and osteomyelitis. Also for prophylaxis before and after extraction and other dental surgery.

When pre-existing cardiac lesions predispose to sub-acute bacterial endocarditis or there is extensive tissue trauma, parenteral penicillin should be given before or at time of extraction followed by Pentids postoperatively.

Pentids and Pentids-Soluble in bottles of 12 and 100.

Pentids®

Squibb 200,000 Unit Penicillin G Potassium Tablets

*PENTIDS® IS A TRADEMARK

SQUIBB

This may be combined with and enhanced by apprehensions arising from other conflicts not connected with the immediate danger of heart failure and death. The presence or absence of anxiety during an attack of angina depends on the adequacy of the patient's characteristic psychologic defenses.

The dreams of these patients reveal that when these defenses fail, the patient experiences anxiety when awakening from an attack. If defenses are adequate, the patient awakens without feeling anxious.

Arlow, Jacob A.: Anxiety Patterns in Angina Pectoris, Psychosom. Med. 14: 461-468 (September) 1952.



Skin Cancer

The possibility of a cure for skin cancer is greater than for any other form of malignancy. This is due to the visibility and accessibility of lesions of the skin. Yet, a large number are undiagnosed (1) because the practitioner may consider an early lesion too trivial to be concerned about, and (2) because he may adopt a policy of watchful waiting, applying some ineffective medicament, and reassuring the patient that he has nothing to fear.

There are six basic principles to be observed in considering diagnosis of skin cancer:

(1) Always consider the possibility of malignancy in cutaneous growths in persons over forty years of age until the true nature of the lesion has been proved. This means that many will require a biopsy and a microscopic examination.

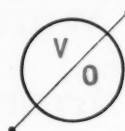
(2) Apply no treatment until a correct diagnosis has been made.

(3) Be familiar with precursor lesions from which the majority of skin cancers develop.

(4) Remember that while skin cancer is essentially a disease of late adult life, it can and does occur at any age.

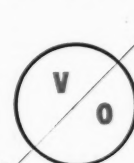
(5) Slow growth is not a sign of benignancy.

Ribbons OF METAL



Posterior

There is new comfort and efficiency in function for your denture patients when you select the unique and revolutionary new V/O Plastic Posterior teeth. By means of cobalt-chromium cutting ribbons embedded in the plastic, increased and grinding efficiency is provided for the masticating muscles. Even hard-to-chew foods are within the range of patients who previously had found difficulty in mastication with ordinary teeth. V/O Occlusal Plastic Posteriors have been mouth-tested over seven years by thousands of patients who wear them with satisfaction.



Another product of creative research by AUSTEN

**PRESCRIBE OR OBTAIN V/O PLASTIC POSTERIOR TEETH FROM
YOUR VITALLIUM LABORATORY**

(6) Some cancers develop from apparently normal skin without a precursor lesion.

The occurrence of cancer of the skin depends upon an interaction of genetic and environment factors. It is a disease primarily of mature years, usually after the fifth decade of life. Ultraviolet and solar radiation, when excessively received (especially in fair-skinned persons) is probably the commonest single cause of cancer on exposed areas of the

skin. Ionizing radiations from x-rays, beta and gamma rays from radium, radium emanations, and radioisotopes are carcinogenic if too much is received by the skin. Polycyclic hydrocarbons from tars, pitch, carbons, and petroleum containing the phenanthrene ring not infrequently result in cancer of the exposed skin in industrial workers.

Any form of chronic irritation may be the precursor factor. Thus, we see malignancy developing in old scars;

histologically before the possibility of cancer can be eliminated.

With carcinoma in the anterior larynx, palpation of the neck may reveal a swelling or tenderness over the thyroid cartilage, suggesting chondritis with neoplastic invasion. With a known laryngeal cancer, any lymphadenopathy of the neck should be regarded as metastatic involvement.

Though metastasis ordinarily occurs late in cordal lesions, the size of the primary growth cannot be accepted as a criterion. Vocal cord neoplasms usually metastasize first to

the nodes overlying the trachea and cricothyroid membrane. Epiglottic carcinoma commonly invades the pre-epiglottic space and metastasizes to the submaxillary, submental, and superior deep cervical nodes. Subglottic lesions metastasize to the inferior deep cervical nodes, often the infra-omohyoid nodes.

Clerf, Louis H.; Putney, F. Johnson; and O'Keefe, John J.: *The Diagnosis of Carcinoma of the Larynx*, *Surg. Clin. North America* 32:1637-1643 (September) 1952.

Contra-Angles



To Exercise Or Not To Exercise

There may be more than two schools of thought on the subject of exercise, but the two that are best known are the violently proexercise addicts and the equally violent antiexercise phlegmatics. This is the time of year when the exercise itch overtakes some of us after the long winter sloth. Some people, such as the mesomorphs described by Sheldon, have the kind of physique that requires exercise. Action seems necessary for the good functioning of their bodies. There are other people who get along without an unnecessary stirring of a muscle. Capacities for muscle work may vary as markedly as the skills in other tissues. Exercise may be one man's fun and another man's torture.

What effect does exercise have on health? Here again, no generalities are in order. Many times the professional athlete has a short life and the sedentary person a long one. Exercise does stimulate tissue metabolism and if not carried to a place of stress and strain is probably beneficial to health. The golfer past 50 who plays 36 holes with the temperature 100 plus degrees Fahrenheit is doing himself no good. Any exercise that produces marked fatigue and unpleasant reaction is harmful despite the age of the person. Fatigue is an unpleasant form of tiredness that is not relieved by a night's sleep. If one plays golf on Saturday and is still exhausted on Monday, it is good evidence that he depleted his body resources rather than added to his stores.

On the subject of exercise in connection with various medical situations the present practice seems to be to encourage early ambulation in surgical conditions and to reduce the period of bed confinement in many

TEMREX

The NEW ANODYNE CEMENT

Primarily Developed for

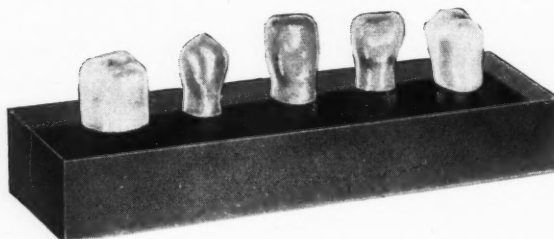
Temporary Jacket Crowns

TEMREX CROWNS

using

INTERSTATE

CROWN FORMS



INTERSTATE Crown Forms in Special NEW Sizes and Shapes filled with TEMREX, Provide Ideal Temporary Crowns . . .

TEMREX

prepared by a new chemical process, combines the therapeutic properties of Eugenol and Zinc Oxide.

TEMREX

was developed primarily as a sufficiently hard, **quick setting** protective cement for use in **Temporary jacket crowns**.

TEMREX

is mixed in the same manner as zinc oxyphosphates, and is available in three shades: yellow, yellowish gray, and white.

TEMREX

forms a solid bond with INTERSTATE Crown Forms, thus providing a strong, solid crown which will remain as long as required for temporary use.

TEMREX

does not contain resin or vegetable oils. It is easily removed from the slab and spatula.

Only TEMREX in INTERSTATE Crown Forms will give you IDEAL TEMPORARY CROWNS

[See Coupon on Page 239]

INTERSTATE DENTAL CO., Inc. NEW YORK 36, N.Y.

medical conditions. We are all familiar with the young mother pried from her bed within a few hours of delivery and the postsurgical patient who is required to move around the room before his wound has begun to heal. Even patients recovering from acute heart conditions are not kept on their backs as long as they were ten years ago. These examples would suggest that the sooner a person returns his body to ambulatory function, the better it is for all the tissues and organs.

Is there any evidence to suggest that physical activity may have a favorable tendency to prevent some diseases? An editorial in the *British Medical Journal* suggests that the lack of physical activity may be a contributing factor in the etiology of coronary disease. They quote Morris and his colleagues as having submitted "an impressive body of evidence consistent with the view that mortality from coronary disease is inversely related to the amount of physical effort which the occupation requires."

We are all aware that the diseases of the heart and blood vessels are increasing. Although the male lifespan is now 65.9 years, while it was 38.3 in 1850 we are not too clear in our minds why this is so. Wilfred N. Sisk, M.D., M.P.H. (*Prevention Magazine*) shows clearly that the life experience of people past middle age (40) has not increased significantly:

"It has become customary in the newspapers and magazines to compare the life expectancy at birth (or in other words, at age 0), of some previous period with the life expectancy at age 0 today. I think this is largely because of the fact that we want to pat ourselves on the back and these figures are best calculated to do the patting. For example, the white males born in 1850 had an average life expectancy of some 38.3 years, while white males born in 1950 had an average life expectancy of 65.9 years. This is a gratifying improvement and I would certainly not want to see us go back to the infectious disease and poor medical care of a hundred years ago which resulted in the death of so many thousands of babies.

Amco-Facts

Every 8.476 seconds a dentist places a P.F. posterior filling.

Why?

Because P.F. has now passed it's time trial period as a permanent, insoluble, adhesive, non-shrinking, wear resistant, esthetic posterior filling. It is unconditionally recommended for all posterior cavities, even on a tooth too far gone to hold an amalgam or inlay.

We've told you before about the 1500 PSI adhesive strength that eliminates the pain and weakening of undercuts. Now let's discuss shrinkage.

P.F. is a reinforced plastic. The reinforcement is in the form of hard tooth-like ores, bonded into the mass with an adhesive. (The same as two sheets of glass are bonded together to make safety glass.)

These ores, which form a great portion of the mass, control the shrinkage.

To prove this to yourself we offer this simple test.

Fill the end of a clean carpule tube with P.F., another with acrylic filling. After they set the difference will amaze you. You will probably have to break the tube to remove the P.F.

The ores also impart wear resistance, greater than amalgam. P.F. will dull a steel bur in nothing flat. You finish P.F. with stones. But we want you to prove all this for yourself.

We offer you a generous sample for one dollar, or you can order thru your dealer.

P.F. will also reduce operating time, reduce operative fatigue, and make operative dentistry interesting, even to your patient.

5-54

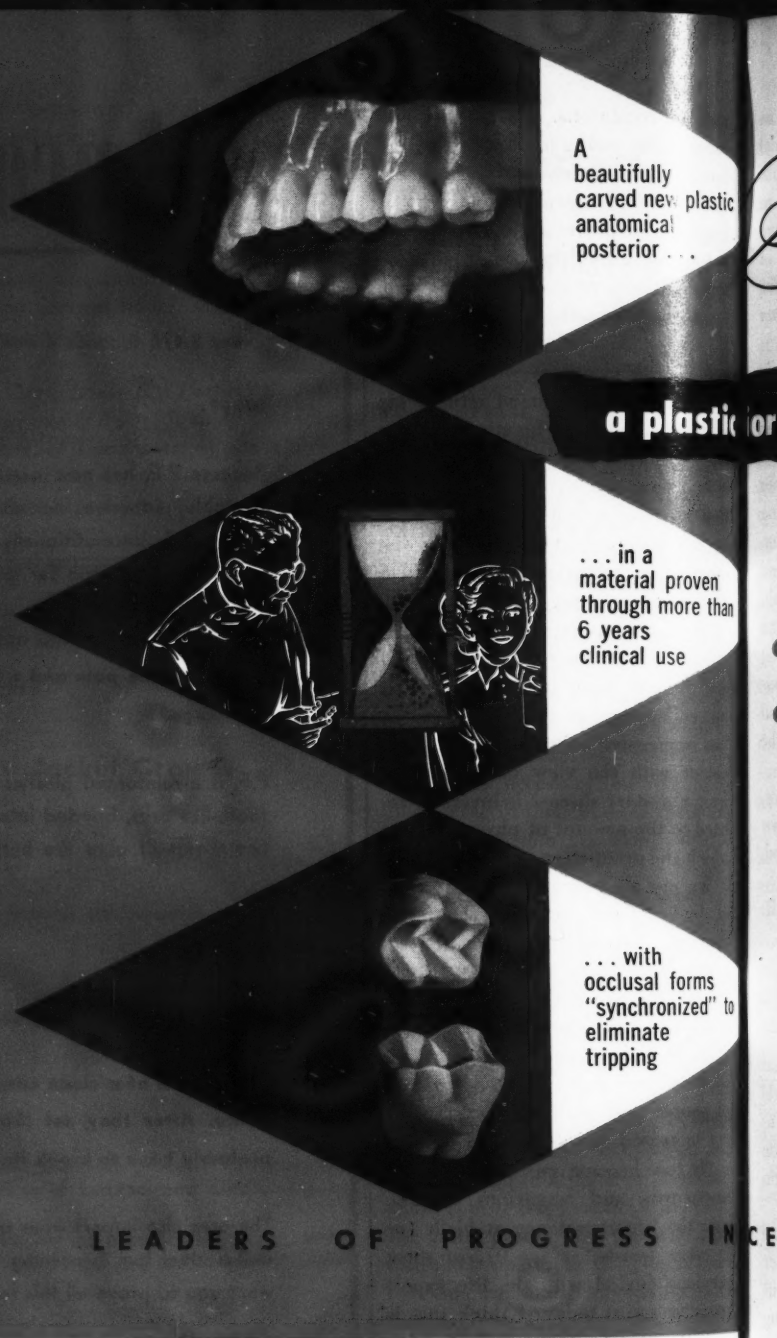


AMERICAN CONSOLIDATED DENTAL CO.

809-11 N. NINETEENTH ST., PHILADELPHIA, PA.

"Actually, those figures mean nothing in the world except the fact that we have saved the lives of many babies who used to die within the first ten years of life from poor medical care and because of the fact that no one knew what to do about infectious disease. The Government and the life insurance companies, however, do not stop with age 0 in figuring out their life expectancy tables, but there seems to be a feeling that the American public wants their facts sugar-coated, so that life expectancy tables for older ages are seldom published except in technical journals. So many wonderful things have been developed in the past 100 years that we certainly have enough things to brag about and we certainly can afford to look at the whole truth even if it is a bit sobering.

"While all of us are interested in the fate of a new-born baby, it is only human to be more interested in the fate of people our own age. The life table for age 10, for example, only shows a moderate improvement between 1850 and 1950 and the improvement decreases as we go up the age scale. For men who manage to live to be 40 years of age, the life expectancy has increased exactly three years in the period between 1850 and 1950. This much improvement could be expected from the discovery of penicillin alone. In 1850 men who lived to be 40 years of age could expect on the average to live to be 68 years of age, while men 40 years of age in 1950 could expect to live to 71 years. At age 50 there has been an improvement in life expectancy of exactly one year. At age 60, 70, and 80 there has actually been a few tenths of a year decrease in life expectancy. When we recognize the fact that medical attention and general care of all people has improved tremendously in the past hundred years, we certainly have a right to expect more improvement in longevity after age 40 than has been the case. In fact, to stay alive 100 years ago required a much more vigorous person than it does today. Life expectancy for the older ages hit its lowest point between 1900 and 1920."



A beautifully carved new plastic anatomical posterior . . .

a plastic for

. . . in a material proven through more than 6 years clinical use

. . . with occlusal forms "synchronized" to eliminate tripping

LEADERS OF PROGRESS IN CE

To return to the editorial in the *British Medical Journal*, we are shown that there are other environmental forces besides exercise that must be evaluated in the consideration of heart disease:

"These findings in coronary heart disease, like some others related to the etiology of common diseases, raise an important issue. The environmental changes which have contributed so much to the decline of mortality since the early years of the nineteenth century were brought about by public authorities, and depended for their

effectiveness hardly at all upon the cooperation of the individual. But many of the etiologic agents now under consideration are of quite a different character: what to eat, whether to smoke, and how much exercise are intensely personal questions which cannot be decided solely by Acts of Parliament, and responsibility for answering them must inevitably rest to a large extent with the individual. At present the task of establishing the significance of food, smoking, and exercise in etiology is sufficiently exacting, and the investigator should

the **NEW** Myerson's

DURA BLEND

Synchronized
ANATOMICAL POSTERIOR

ic or you can use with complete confidence

An anatomical form that eliminates tripping —
in a plastic material of proven durability.

- Synchronized occlusal forms eliminate tripping (which does double damage by trauma to tissue and excessive wear of teeth).
- The most durable tooth resin known (proven in more than six years use) eliminates excessive wear.

It's this happy combination of form and material that makes Myerson's Synchronized Posterior a tooth you can use with complete confidence. Check these other important advantages:

- ✓ Perfect for partials
- ✓ Can be opposed to natural, porcelain or plastic teeth with complete confidence
- ✓ Super-bonding to hot or cold-cure denture base material

For convincing proof of the superiority of Myerson's Synchronized Posteriors, write today Dept. DD-54

Myerson

TOOTH CORPORATION · Cambridge 39, Mass.

CELAIN AND PLASTIC TEETH

not be deterred by the practical implications of positive findings. But it is as well to recognize that when positive findings are forthcoming they suggest no easy remedy, but on the contrary raise issues, personal as well as public, for which the experience of nineteenth-century public health has hardly prepared us."

The significant thing in this statement is that the control of the diseases of childhood by immunization, vaccination, quarantine, and the control of infectious diseases by sanitary engineering and improved living condi-

tions were done by public health action. The antibiotics came later. The person in a democratic society is jealous of his freedom to eat and drink as he pleases, to live under conditions and to clothe himself as he chooses; to exercise or not as he wishes. No person who cherishes his own independence would wish to see these freedoms of choice taken away from anyone else. The fact is one that we cannot evade: man can improve his health and well-being by deliberate choices made by himself and by the appropriate actions that

Others Have Tried BS POLISHERS Why Not You?

Many dentists have sent in the coupon below and found out why BS Polishers are preferred over many others. They can readily understand why this soft, flexible rubber polisher makes a patient feel safe and comfortable, also why it is easy for it to clean and polish every tooth to a lustre brightness. Why don't you find out these facts for yourself? Send the coupon in now!



BS POLISHERS ARE SMALLER AND MORE CONVENIENT TO USE

Young Dental Mfg. Co.
St. Louis 8, Mo.

Gentlemen:

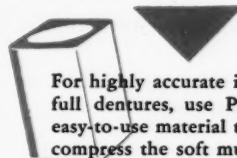
Without any obligation send us one of your BS POLISHERS—ABSOLUTELY FREE.

NAME

ADDRESS

CITY

STATE



For highly accurate impressions for full dentures, use Plastogum — the easy-to-use material that does NOT compress the soft mucosa or tissue.

Ideal for McGrane Procedure, Micro Denture Procedure, Full Compound and Full Plaster Technics and in rebasing.

Plastogum has a controlled setting time with an intermediate or moulding stage to permit best results in muscle trimming.

- It does not shrink after setting.
- It breaks with a definite, clear fracture.
- It's pleasantly flavored. Economical to use.

Order through your dealer

PLASTOGUM

Mail coupon for a FREE sample!

HARRY J. BOSWORTH CO.
216 W. Jackson Blvd., Chicago 6, Ill.

Kindly send FREE sample of Plastogum.

Doctor.....

Address.....

Dealer.....



ORTHOCLASP

100% PRECIOUS METAL WIRE

You can eliminate wire breakage from your practice with Baker OrthoclasP Wire. This has been proven definitely by many hundreds of leading Dentists and Orthodontists, in actual practice.

Baker OrthoclasP Regular for clasps, orthodontic appliances, etc. and OrthoclasP #2 for posts, pins, attachments, etc., against which any metal in Dentistry can be cast—provide qualities that you cannot get with any other wires.

Both, are 100% precious metal... pure platinum color... they do not oxidize... do not soften... do not temper with heat treatment! Can even be formed while red hot!

A comparison of physical properties tells the story. Ask for our folder, "You can definitely cast against OrthoclasP Wires."

BAKER

THE WORLD'S LARGEST
WORKERS AND SUPPLIERS
OF PRECIOUS METALS

BAKER & CO., INC. 850 PASSAIC AVENUE • EAST NEWARK, N. J.
NEW YORK 7 • SAN FRANCISCO 2 • CHICAGO 2

CLINICAL AND LABORATORY SUGGESTIONS

(See pages 220 and 221)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

Subject: _____

Explanation of Procedure: _____

Sketch: _____

Suggestions submitted cannot be acknowledged or returned.

\$10 will be paid on publication for each suggestion that is used.

stem from these choices. Most of us are looking for the great medical discovery, for another and even more magical drug, for the short cut to health. To exclude things that we have developed habits for and pleasures in is one of our hardest disciplines. *Far easier for us to take something than to give up something.*

If people are to improve their health habits they must be informed. That kind of training must begin in the kindergarten and be carried through every college course. These courses should be as important as learning the fundamentals of reading, writing, and arithmetic. In high schools and colleges the health educator should have as much prestige as the football coach. In addition, the public must be told how to detect the falsehoods on health subjects that are spread through publications and over the radio and television.

Today people are in a quandary. They are pulled and hauled and know not what to believe in matters of food, smoking, drinking, and exercise.

—E.J.R.

Dermal Sinuses of Dental Origin

GURDIN and Pangman¹ point out that when a sinus occurs within the oral cavity, the teeth may be suspected as the cause, but should the same lesion occur on the skin, the dental origin may be overlooked.

Evidence Noted—The findings are usually skin papilla with chronic or recurrent drainage of pus and sinus formation as determined by probing or x-ray examination. If the sinus opening is not too distant from the involved dental root, the probe end may be guided to the root.

Possible Conditions—A cord-like structure on intraoral palpation that extends from the external opening to the alveolus was present in one of the three cases described. X-ray evidence of root abscess, dental cyst, or localized osteitis may be observed. Intra-oral roentgenograms may show spi-

¹Gurdin, M., and Pangman, W. J.: Dermal Sinuses of Dental Origin with Report of Three Cases. Plastic & Reconstructive Surg., Baltimore 11:419-522 (June) 1953.

cules of retained roots in an endentulous alveolus or a small area of localized osteitis which might be missed in routine extraoral x-ray examination.

Three Cases Reported

Case One—In this case a diagnosis of skin cancer had been made until methylene blue was injected into the opening of the sinus and a metal probe inserted. Dissection was carried along the probe to include all stained tissue, which was found to end against the alveolus in the region of the lateral incisor of the upper jaw. An apical abscess with granulation tissue was curetted and packed open, and healing occurred per primum. There has been no recurrence.

Case Two—In the second patient the lesion on the cheek was mistaken for another pustule as this patient had a pustular acne.

Case Three—The third patient had had a "cyst" of the cheek for three years.

Factors that may confuse the diagnosis are (1) the absence of a history of acute dental abscess, (2) a negative x-ray examination, (3) an endentulous mouth, (4) a confusing biopsy report, and (5) a positive bacteriologic report, such as the detection of organisms belonging to the *Actinomyces* group.

Epidermoid cysts, salivary fistula, thyroglossal sinus, bronchial sinus, actinomycosis, and syphilitic osteitis must be taken into consideration in the differential diagnosis.

The pathologic condition in the jaw must be corrected first. If a chronic apical abscess is present the tooth should be extracted and retained root or sequestrum should be removed, and the granuloma curetted. Most sinus tracts will then close. However, if the sinus has persisted for a long time, surgical excision may be necessary.

Adapted from Medical Literature Abstracts, *Journal of the American Medical Association* 153:594 (Oct. 10) 1953.

BUY SECURITY BONDS



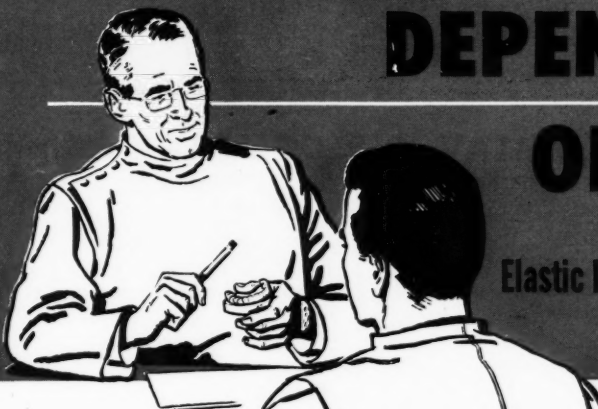
**Kids
love it!**

The Castle That Was Destroyed is a colorful folder about dental health. Kids love it. And before they know it, they learn easy-to-remember dental truths. And some of them carry the word to other kids, and to parents, too. Price, 100 for \$15.

DENTAL DIGEST
1005 Liberty Ave., Pittsburgh 22, Pa.

YOU CAN DEPEND ON

Elastic Impression Cream



**No Other Impression Material
Offers You All These Advantages!**



QUICK, SMOOTH MIXING—**HEAVY CONSISTENCY** when carried to place, assuring utmost detail.

EXTREME ELASTICITY—permitting removal over severe undercuts without damage to the impression.

FIRM BODY after setting, which eliminates any fear of distortion when pouring cast.

SMOOTH STONE CASTS without a fixing solution.

UNFAILING ACCURACY—the assurance of a supremely satisfactory restoration.

CONSISTENT FORMULATION—your guarantee that *every* package of D-P will give you the *same* results, time after time.

Order D-P
From Your Dental
Dealer NOW!



dental perfection co.
543 West Arden Ave., Glendale 3, Calif.

After Prophylaxis . . .

LAVORIS
REG. U.S. PAT. OFF.
**MOUTHWASH
and GARGLE**

Considerable discomfort inevitably attends a thorough scaling of the teeth.
A cotton roll saturated in Lavoris and laid along the gum margins for a few minutes following this operation will relieve soreness, help control minor hemorrhage and tone and constrict the tissues.

A PRODUCT
OF MERIT FOR
50
YEARS

THE LAVORIS COMPANY, Minneapolis, Minn.

See second cover

D.D.5

UNIVERSAL DENTAL CO.
48TH AT BROWN STS., PHILADELPHIA 39, PA.

Please send information concerning Veri-Chrome Porcelain and Verident Plastic.

Dr. _____

Address _____

City _____

See page 193

D.D.5

LAMBERT PHARMACAL CO.
JERSEY CITY, N. J.

Please send samples of Antizyme Tooth-paste.

Dr. _____

Address _____

City _____

See page 194

D.D.5

WILLIAMS GOLD REFINING CO.
BUFFALO 14, N.Y.

Please send shipping containers and labels for scrap gold.

Dr. _____

Address _____

City _____

See page 195

D.D.5

THE S. S. WHITE DENTAL MFG. CO.
PHILADELPHIA 5, PA.

Please send information on office planning service.

Dr. _____

Address _____

City _____

See page 196

D.D.5

ROCKY MOUNTAIN METAL PRODUCTS CO.
BOX 1887, DENVER 1, COLORADO

Please send brochure on permanent Central Crowns.

Dr. _____

Address _____

City _____

See page 197

D.D.5

THE L. D. CAULK CO.
MILFORD, DEL.

Please send information on Lucitone.

Dr. _____

Address _____

City _____

See page 198

D.D.5

THE J. M. NEY CO.
HARTFORD, CONN.

Please send technic books.

Dr. _____

Address _____

City _____

See page 225

D.D.5

VERNON-BENSHOFF CO.
P. O. BOX 1587, PITTSBURGH 30, PA.

Please send information concerning Vernomite Realist.

Dr. _____

Address _____

City _____

See page 227

D.D.5

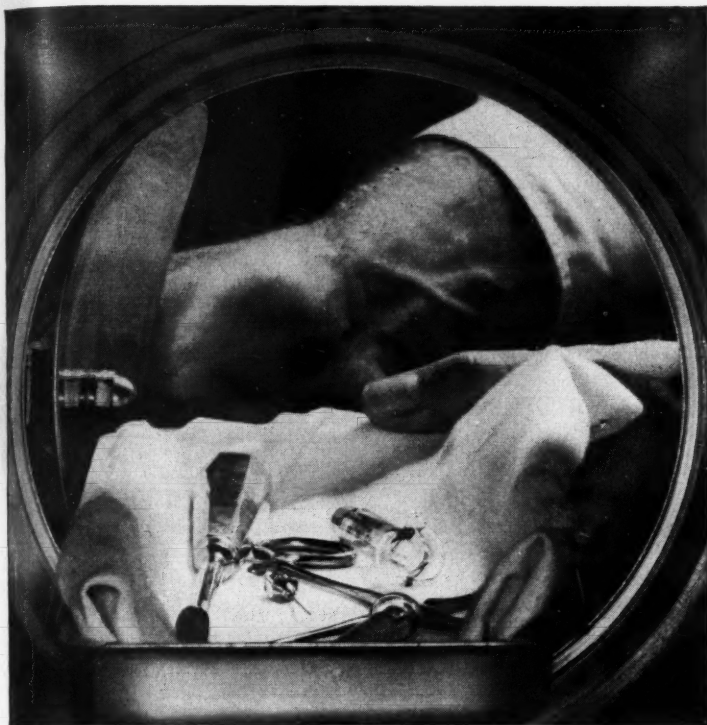
E. R. SQUIBB & SONS
745 FIFTH AVE., NEW YORK, N.Y.

Please send Pentids information.

Dr. _____

Address _____

City _____



**when you open this door . . .
that's the end of hepatitis danger**

You can't tell when one of your patients carries a hepatitis-causing virus in his bloodstream—yet it takes just *one* to start cross-infection in your practice.

But you do know that this tough virus, like other hard-to-kill spore-bearers, is stopped dead by steam-pressure autoclaving.¹ That's how hospitals prevent cross-infection.

And now you can use this safe, hos-

pital-proved technique right in your office! At a price you can afford.

Castle's "777" Speed-Clave costs just \$208!²

Small enough to fit on a shelf, the "777" autoclaves cotton, and needles and instruments which enter the bloodstream—puts a sure end to hepatitis danger.

Phone your Castle dealer for a quick look, or write direct.

¹Bibliography and helpful literature are yours for the asking.
²Priced upwards to \$211 according to zone.

Castle LIGHTS AND STERILIZERS
WILMOT CASTLE CO. • 1109 UNIVERSITY AVE. • ROCHESTER 7, N. Y.

See pages 228-9 D.D.5
AUSTENAL LABORATORIES, INC.
5932 WENTWORTH AVE., CHICAGO 21, ILL.
Please send illustrated technique on V/O Plastic Posteriors.

Dr. _____
Address _____
City _____

See page 230 D.D.5
INTERSTATE DENTAL CO., INC.
220 WEST 42ND STREET, NEW YORK 36, N.Y.
Send me just 1 TEMREX liquid and powder (specify shade) with 6 Crown Forms.

Dr. _____
Address _____
City _____
Dealer _____

See page 231 D.D.5
AMERICAN CONSOLIDATED DENTAL CO.
809-11 N. 19TH ST., PHILADELPHIA, PA.
Please send information concerning AMCO products.

Dr. _____
Address _____
City _____

See page 232-3 D.D.5
MYERSON TOOTH CORPORATION
CAMBRIDGE 39, MASS.
Please send information about Synchronized Posterior Teeth.

Dr. _____
Address _____
City _____

See page 233 D.D.5
YOUNG DENTAL MFG. CO.
ST. LOUIS 8, MO.
Please send free BS Polisher.

Dr. _____
Address _____
City _____

See page 233 D.D.5
HARRY P. BOSWORTH CO.
216 W. JACKSON BLVD., CHICAGO 6, ILL.
Please send free sample of Plastogum.

Dr. _____
Address _____
City _____

See page 234 D.D.5
BAKER & CO., INC.
850 PASSAIC AVE., EAST NEWARK, N.J.
Please send folder about Orthoclaspl Wires.

Dr. _____
Address _____
City _____

See page 235 D.D.5
THE COLUMBUS DENTAL MFG. CO.
COLUMBUS 6, OHIO
Please send information concerning your products.

Dr. _____
Address _____
City _____

See page 237 D.D.5
DENTAL PERFECTION CO.
543 WEST ARDEN AVE., GLENDALE 3, CALIF.
Please send information concerning Elastic Impression Cream.

Dr. _____
Address _____
City _____

See page 239 D.D.5
WILMOT CASTLE CO.
1109 UNIVERSITY AVE., ROCHESTER 7, N.Y.
Please send information concerning the Castle "777."

Dr. _____
Address _____
City _____

See third cover D.D.5
COOK-WAITE LABORATORIES, INC.
1450 BROADWAY, NEW YORK 18, N.Y.
Please send Ravocaine information.

Dr. _____
Address _____
City _____

See back cover D.D.5
THE DENTISTS' SUPPLY CO.
YORK, PA.

Please send information concerning Bioform Teeth and Trubyte Denture Veneers.

Dr. _____
Address _____
City _____

In your ORAL HYGIENE this month

So You Want

Social Security?

Doctor Philip Parker speaks for all dentists who want Social Security coverage—and he believes that *most* dentists *do* want it, despite the House of Delegates' vote to the contrary at the Cleveland meeting of the American Dental Association.

Doctor Parker advises: "While you are waiting for the American Dental Association to become more responsive to the needs of its members . . . you can strengthen the hands of those who are trying to help you obtain Social Security coverage by writing them . . . Congressman Daniel A. Reed (Chairman of the House Ways and Means Committee) is as close as your nearest mailbox. The power of the individual American's 'pen' is still paramount in this country. So, take your pen in hand and write now!"

★ ★ ★

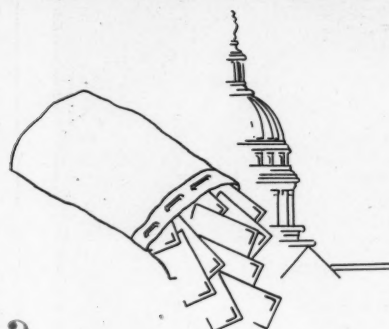
"Should a Dentist Buy Annuities?" That is the question Sidney Scott Ross asks—and answers with a helpful detailed description of the advantages and disadvantages of the various types of annuities which are being offered by the insurance companies today.

★ ★ ★

Do you happen to know Doctor Robert Emmett Motley, a dentist in the Washington, D.C., area? Though 66 years old, this man is as active as a Geiger counter hovering over the Marshall Islands. He paints, raises azaleas, roses, and bees; he roller skates, plays the organ, and sometimes does a bit of hand-crafting and wood-working. Henry Fankhauser, of the *Washington Daily News*, wrote the article, "Roller Skating Dentist."

★ ★ ★

"Why Is Small-Town Practice Evaded by the Dentist?" asks Doctor



D.E. Holtman, a dentist who has practiced in a city of 80,000, in the United States Army, in a medium-sized city of 11,000, and in a town of only 600 population. He weighs the advantages and disadvantages of the different types of community and practice.

★ ★ ★

"Watch Out for Bad Debts in 1954," warns Harold J. Ashe. A patient who was a first-rate credit risk in the past may be a bad risk this year. Decreased overtime may be expected to alter drastically the manner of living of a great group of wage earners.

★ ★ ★

Did you know that 10% of all air-conditioning units are sold to dentists, physicians, and other professional people? The article, "You Can Control the Weather," points out some of the advantages to both you and your patients, of operating in temperature-controlled comfort.

★ ★ ★

"Take Time to Tell Your Patient," suggests Doctor Harry C. Peake. "Most dentists consider the extraction of a tooth as commonplace as clipping fingernails, but a patient does not share this feeling."

★ ★ ★

"A Dentist's Folk Tales Bring Fame and Gain." Charles H. Waterbury writes about Doctor Moritz A. Jagen-dorf's books of folk lore, "New England Bean Pot," "Up State Down State," "Merry Men of Gotham," and a new one on which the dentist-author is now working, "Middle States." Perhaps you have some favorite folk tales you'd like to contribute to the collection.

The Temporomandibular Joint in Vitamin C Deficiency

(Continued from page 214)

cells and the abundance of macrophages. There is now frank hemorrhage into the temporomandibular joint.

Results from Ascorbic Acid Therapy—Three days following ascorbic acid therapy there is reduction of the edema fluid. Tremendous regrowth of osteophytic bone subperiosteally has increased the lateral ramus width at least threefold. Many of the osteophytes resemble cartilage, especially at the periosteal margin. There is gradual resolution of the pink-staining structureless material in the subchondral area. The fractures that occurred at the cartilage-shaft junction are being repaired by a large callus formation.

Adapted from *Journal of Dental Research* 32:622-625 (October) 1953.

Advertising Index

American Consolidated Dental Co.	231
Austenal Laboratories, Inc.	228-9
Baker & Co., Inc.	234
Bosworth Co., Harry J.	233
Castle Co., Wilmot	239
Caulk Co., L. D.	197
Columbus Dental Mfg. Co.	235
Cook-Waite Laboratories, Inc.	3rd Cover
Dental Perfection Co.	237
Dentists' Supply Co., The	4th Cover
Interstate Dental Co., Inc.	230
Lambert Pharmacal Co.	193
Lavoris Co.	238
Myerson Tooth Corp.	232-3
Ney Co., The J. M.	198
Rocky Mountain Metal Products Co.	196
Squibb & Sons, E. R., Div. of Mathieson Chemical Co.	227
Universal Dental Co.	2nd Cover
Vernon-Benshoff Co.	225
White Dental Mfg. Co., The S. S.	195
Williams Gold Refining Co.	194
Wilmot Castle Co.	239
Young Dental Mfg. Co.	233